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Founded by Morton Prince, 1906

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Commemorating
The Founding of this Journal Fifty Years Ago
The Birth of
Sigmund Freud
One Hundred Years Ago

Volume 52 MAY 1956 Number 3

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The Journal of Abnormal and Social Psychology

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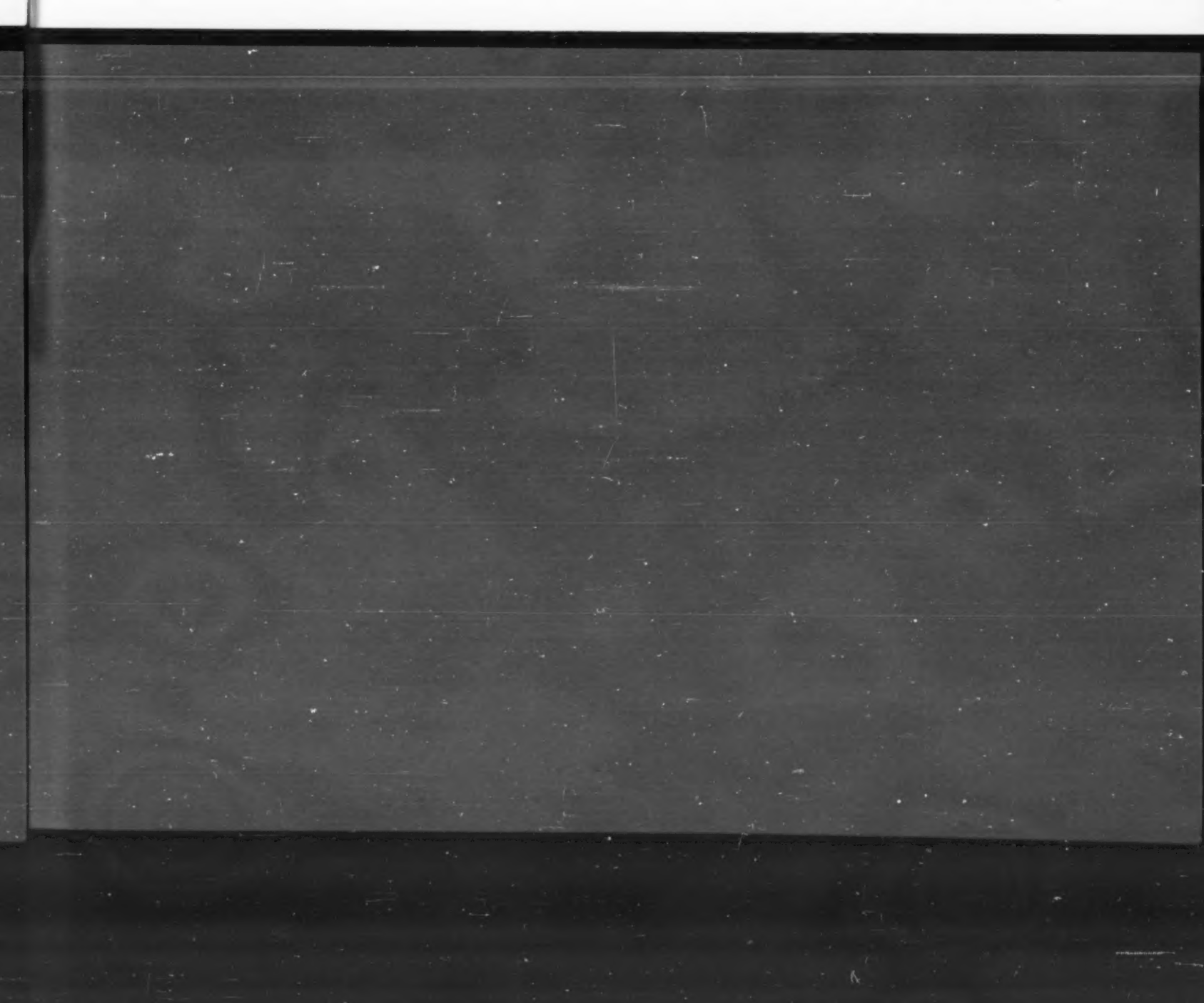

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The JOURNAL OF ABNORMAL AND SOCIAL PSYCHOLOGY is devoted to both abnormal and social psychology. Its emphasis is on basic research and theory rather than the techniques and arts of practice. Abnormal psychology is broadly defined to include papers contributing to fundamental knowledge of the pathology, dynamics, and development of personality or individual behavior, including deterioration with age and disease. Articles concerned with psychodiagnostic techniques are evaluated with respect to their contribution to an understanding of the psychological principles of diagnosis; those concerned with psychotherapy are judged in terms of their contribution to an understanding of the therapeutic process. Case reports are considered in terms of their heuristic value. Reports which serve to pose or to clarify important theoretical problems, or which promise to be useful in teaching, are often published. From the social area, this JOURNAL gives preference to papers contributing to basic knowledge of interpersonal relations, and of group influences on the pathology, dynamics, and development of individual behavior.

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DR. M. BREWSTER SMITH
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EDITORIAL NOTE: THIS ANNIVERSARY NUMBER

One hundred years ago, on May 6, 1856, Sigmund Freud was born. Fifty years ago, on April 1, 1906, Morton Prince issued the first number of this Journal. It is most appropriate to celebrate this dual anniversary on a single occasion, for the ferment of Freud's discoveries has strongly influenced the papers published here in the past fifty years. Ernest Jones's reminiscences in his Anniversary Greeting remind us, indeed, that psychoanalysis found a hearing in the Journal from its very beginning. Elsewhere he has written that

> [Prince] freely opened his periodical, *The Journal of Abnormal Psychology*, to papers on psychoanalysis, almost the only one then available for that purpose. (*The Life and Work of Sigmund Freud*, Vol. 2, p. 60. New York: Basic Books, 1955.)

It was easy to decide on the person through whom the Journal should recognize Freud's centenary. Ernest Jones uniquely embodies Freud's tradition as his colleague and eminent biographer. His identification with this Journal in its formative years is equally close: he served with Morton Prince as Assistant Editor of the volumes published from 1910 to 1914, continuing from 1915 to 1921 as Assistant Editor for the British Isles. Knowing of his labors to complete the third and final volume of his Biography, I invited his contribution with much misgiving. To be able to publish his greeting is therefore most gratifying.

To Dr. Jones the Journal is also indebted for the hitherto unpublished photograph of Freud that accompanies his remarks. I had inquired about the possible existence of a picture of Freud as he appeared when the Journal was founded in 1906. The reply came in a letter of November 21, 1955:

> Freud was only photographed once in the years you mention. That is the Photograph of 1906 which serves as a frontispiece in Vol. II of my Biography. I seem to remember, however, that another photograph . . . was taken on the same day and has never been used. If so it would be in the possession of Mr. Ernst Freud, . . . to whom you could write.

So I did, with alacrity. The Journal is most grateful to Mr. Ernst L. Freud of London for the privilege of presenting this portrait, which readers will be interested to compare with its already published twin.

In paying tribute to Freud on his centenary the Journal joins with much of the civilized world that has felt his seminal influence. The Journal's own fiftieth birthday, on the other hand, is our private celebration. Gordon Allport's detailed account in his initial editorial (this Journal, 1938, **33,** pp. 3–13) makes it unnecessary to review the history of the Journal, while I have recently discussed its present prospects (this Journal, 1956, **52,** pp. 1–4.) Contemporary students of abnormal and social psychology may appropriately pause, however, to acquaint themselves with its founder, Dr. Morton Prince, whose vigorous influence as psychologist, psychopathologist, and editor lies more than a quarter of a century in the past. I therefore asked Henry A. Murray, his colleague and successor at the Harvard Psychological Clinic, to contribute the memoir that follows Dr. Jones's greeting. The photograph of Prince, for which thanks are also owed to Dr. Murray, is the one Prince presented to the Clinic.

This anniversary number reflects another, more specific debt to Prince. In offering the Journal as a gift to the American Psychological Association in 1925, Prince wrote:

> The only condition that I would make in donating the Journal, and if it be accepted by the Association, is that any profit that may accrue after paying all legitimate expenses shall be used solely for the benefit of the Journal and its subscribers, and shall not be used for any other purpose.

Since these pages are paid for by such funds, they do not subtract from the space normally allotted to scientific papers. The Journal's most appropriate tribute to Freud and to Prince on this double anniversary, after a pause for pleasant and proper ritual, is surely to get on with its business of publishing new contributions to its field.

M. Brewster Smith

AN ANNIVERSARY GREETING

ERNEST JONES

Sussex, England

THE *Journal of Abnormal and Social Psychology* is celebrating its Jubilee, and the date brings back to me many personal memories, since I was a subscriber to its first issue and for some years collaborated actively in its production. A coincidence connecting this celebration with that of the centenary of Freud's birth may be mentioned at the outset. The knowledge of Freud's work, or perhaps one might say the rumor of it, had reached neurological and psychiatric circles in America in the first years of the century. In founding the new periodical Morton Prince was eager to usher it in with a contribution from Freud, so he wrote to him on August 1, 1905. Receiving a negative reply he called on Dr. J. J. Putnam who wrote a paper on psychoanalysis. This was the first account of psychoanalysis to be published in America, but Putnam was at that time poorly informed so that his description, in spite of his endeavor to be as fair as possible, was not a very adequate one. He remedied it three years later after having studied the subject more intensively by then writing his paper "Personal Impressions of Sigmund Freud and His Work," published in Volume 4 of the Journal. My first of many contributions to the Journal was in 1907. I had been in regular personal correspondence with Morton Prince for several years, and when I came to America in 1908 my first visit was to him. He put me in charge of the reviewing and abstracting departments, and presently got me to help him also with the general editorial work. This cooperation continued for four years until I left America. Morton Prince was invited to the First International Psychoanalytical Congress in April, 1908, but although he announced a paper on "Psycho-galvanic Reactions in a Case of Multiple Personality" he was at the last moment prevented from attending. When in that year the *Jahrbuch der Psychoanalyse* was founded I suggested that it be published in three languages and amalgamated with the *Journal of Abnormal Psychology*, but Morton Prince preferred his independence. The early numbers of the Journal contained such interesting popular reading that one heard of elderly clergymen reading the stories aloud to their families, so Morton Prince had to be rather careful about the erotic aspects of the topics. I remember this leading to disagreement between him and Brill who was wont to call a spade a spade. Later on Prince became bolder and at the beginning of 1913 was threatened with police prosecution for the "obscenities" he was publishing in his Journal. He had no difficulty, however, in suppressing it.

From the beginning I had not much liked the title Prince had chosen for his periodical. To stigmatize our type of psychology as being "abnormal," and still more ourselves as "abnormal psychologists" struck me as somewhat ambiguous, and I voiced my misgiving in a paper written for the volume that was composed in Morton Prince's honor in 1925. It had become plain early on that our researches in psychopathology had important bearings on the study of the psychology of so-called normal people and that it would therefore have many social repercussions. It was therefore very fitting that the title of the periodical should be extended to include the words "social psychology."

I would extend my best wishes to the Journal on its entrance into its second half-century.

SIGMUND FREUD, 1856–1939

MORTON PRINCE: SKETCH OF HIS LIFE AND WORK[1]

HENRY A. MURRAY

Harvard University

THE founder of the *Journal of Abnormal (and Social) Psychology*, of the American Psychopathological Association, and of the Harvard Psychological Clinic was born in Boston, on December 21, 1854, and christened Morton Henry after his maternal uncle. His mother was Helen Susan Henry of Philadelphia and his father Frederick Octavius Prince of Boston. The latter contributed genetic particles that had been conserving their potential in New England for more than two centuries and in due course offered his son a model of a public-spirited man with multifarious concerns, chief of which were law and politics. He was a respected Mayor of Boston for three terms, a candidate for Governor, and for a number of years Secretary of the Democratic National Committee.

His son Morton (he eventually dropped his middle name) prepared at the Boston Latin School and in the fall of 1871 entered Harvard for study and for sport. What cliques, gangs, secret societies, or roving bands of desperados this archfounder founded in his younger days is matter for conjecture. The first indisputable evidence we have of this propensity comes from the annals of Harvard athletics, where it is recorded that in 1872 he participated in the establishment of the Harvard University Football Club, that he served on the committee to codify the rules of the so-called "Boston game," and that, two years later, he played "rusher" on the team that defeated McGill University three touchdowns to none. This match, played under the Rugby rules of Canada rather than the Boston rules, has been celebrated as the point of origin of American football, as distinguished from soccer, and the impression that it left in the mind of the young "rusher" was vivid as life for more than half a century. Despite a multiplicity of maturer passions and pursuits there was no fading of his interest in sport.

After graduating from college in 1875, Prince enrolled at the Harvard Medical School where he soon distinguished himself by winning the Boylston Prize with an essay on "The Nature of Mind and Human Automatism." He worked for awhile at the Boston City Hospital and in the summer of 1879, after receiving his degree, set forth on the traditional grand tour of Europe with the special purpose of supplementing his education with courses of clinical instruction at Vienna and at Strasbourg. "I managed not to overdo it," he said in recollecting how amply he had seasoned the solid nutriment of science with the spice and salt of various and sundry pleasures. Such throughout his life would be the style and pace dictated by his temperament.

On returning to Boston, he set up a shingle which, so he declared, was carefully guarded from rust and freshmen. "This is what they call practising medicine," he wrote in his class report. "My office hours are from 1 to 3 P.M., when I shall be glad to see any of my friends, but particularly my enemies, and if I cannot promise them a sure cure, I will agree to send in my bill promptly and regularly."

In the beginning of his career Prince was a general practitioner with a leaning toward diseases of the nose and throat. But as time went on his thought became increasingly engaged with the phenomena of psychopathology.

His mother suffered from a mysterious neurotic ailment—all neurotic ailments were mysterious in those days—and this may well have prompted him to search the literature for the most recent knowledge of cases of this sort. Anyhow, in the early eighties he took his mother to the renowned consulting room on the Boulevard St. Germain in Paris of the world's supreme authority on the maladies of mind and nervous system. It may have been Charcot, the charismatic white-haired Master of La Salpêtrière,

[1] The bulk of this paper appeared in the *Harvard Alumni Bulletin*, January 23, 1930, Part One, pp. 490–495.

with "the head of a Caesar and the eye of an eagle," already a half-legendary figure, who, more than any other man, served to crystallize the dispersed and tentative aspirations of the young American into a definite image of the ideal, in the sight of which he could adventure and persist until he died. As Charcot acted, according to reports, so, in many ways, did Prince perform in later life, and he was never tired of recalling his impressions of the godlike doctor and professor whose mere appearance was enough to exorcize the devils of some patients. But if the impact of Charcot, his erudition, his unerring judgment, his spectacular demonstrations, his mana, influenced the course of Prince's mental life, it was by delayed action after a period of incubation.

Not until two years after his marriage in 1885 to Fanny Lithgow Payson of Salem—a lovely gentle girl who, like his mother, suffered from psychogenic symptoms—did Prince begin to specialize in nervous and mental disorders and embark on a series of startling observations and experiments which were destined to carry knowledge of a new and unsuspected order of psychological phenomena far beyond the limits of Charcot's conceptions. I refer, of course, to the operations of unconscious psychic processes, which, though no longer new to us, are still at the frontier of today's psychology. It was Charcot's brilliant pupil, Pierre Janet, who, with the publication in 1887 of his now classic studies of hysteria, opened the path to this unexplored territory of mental operations. There was also the work of Liebeault and Bernheim on autosuggestion, the ingenious experiments of Gurney which indicated that dissociated processes could be artificially induced by hypnosis, and, finally, in 1889, to name a stimulating influence nearer home, William James's thought-provoking paper on automatic writing.

These findings and reflections were significant leads, and Prince, whose nostril for a live scientific trail was unusually keen and whose sense for the crucial experiment uncanny, was soon in the midst of a thorough examination and penetrating analysis of dissociated processes, occurring in the course of hysteria or induced by hypnosis, and especially of multiple personality, that "gold mine," as James called it, for psychological research. The culmination of these labors was marked by the publication of *The Dissociation of a Personality* (1905), a book which created a sensation wherever English was read. Long before this, however, through his contributions to medical journals, Dr. Prince was known to the profession. Indeed, as early as 1893, when he visited Bernheim at Nancy, he found that the clinicians there were familiar with his work, and he was heartened to be greeted as a respected confrere.

Having a decided predilection for the more readily observable and demonstrable things of this world, it was natural for Prince to select hysteria, with its dramatic objectifications of psychical processes, as focus for a lifelong scrutiny and inquiry. There were no manifestations of this protean disease with which he was unfamiliar, and later, by drawing upon an exhibitionistic vein in his nature, which in earlier years had been masked by a certain nervousness, he became a veritable artist at describing and displaying them before enthralled audiences.

Prince's favorite concepts—innate and acquired dispositions, automatisms, complexes and their integrations, conflict and repression, meanings, symbols, root experiences and memories, and finally suggestion (as a therapeutic measure for the reorganization of personality)—were largely derived from other theorists. But he excelled in operationally defining and supporting them through a series of what must have been the most ingenious psychological researches of a fundamental nature ever performed. A half century ago "fabulous" was the word for these experiments: deathlike trances, automatic writing, crystal visions, spontaneous hallucinations, metamorphoses far stranger than Stevenson's Dr. Jekyll and Mr. Hyde, and, to summit all, the phantasmagoria of Miss Beauchamp, that lady with a whole boarding-house of characters in search of a creative author. All of these shadowy and shady dramas were enacted in Dr. Prince's home office on the sunny side of Beacon Street in Boston, with no fly on the wall as witness of the miracles performed.

The sum and substance of these investigations was published in *The Unconscious*

MORTON PRINCE, 1854–1929

(1914), a book which, because of its exposition of the scientific method in psychopathological research and of its lucid conceptualizations of co-conscious and subconscious psychic processes, established Prince's reputation as the leading experimental psychiatrist in America, if not in the world.

In appraising the scientific contributions of Morton Prince, we should not lose sight of the fact that, throughout those years, when the medical profession was giving its undivided attention to the physical origins of disease, he was almost alone in upholding the theory of psychogenesis and was constantly engaged in putting this theory into practice by giving concrete relief to a large proportion of the sufferers who came to him for treatment.

The researches of Dr. Prince were carried out in relative clinical isolation as part of his private practice, and it is not to be wondered at that his medical contemporaries for many years greeted the communications of his so singularly novel data with all-too-human skeptical complacency, or worse. Prince spoke good-humoredly of "distinct antipathy, on the part of neurologists and psychiatrists, and indifference in academic psychological circles." His conceptions were "resented and resisted as heresy." But with the confirmation of many of his findings by other workers he obtained, finally, through an enviable persistence, a fairly wide acceptance of his formulations, and he was just about to be accorded a glorious place under the sun when the domain of thought in which he had spent his energies was invaded and conquered by the libido theory. Within a few years Prince became familiar with the feelings of a castaway. "Freudian psychology," he wrote in 1928, "had flooded the field like a full rising tide, and the rest of us were left submerged like clams buried in the sands at low water."

In the realm of general ideas Prince, as a psychical monist and as an exponent of a purposive psychology, bridged for a little while the gulf between academic psychology and psychoanalytical theory. In this respect he stood closest to his friends, Janet, James, and McDougall. He had no inclination for tedious studies of the minutiae of physiological psychology and little patience with the bold and sometimes reckless speculations of the analysts of this and that persuasion. He sought, primarily, concrete empirical data on the holistic level elucidated whenever possible by experiment, and, secondarily, generalizations adequate to describe the observed phenomena.

Besides his two major works, Prince contributed over one hundred articles of a psychological and philosophical nature to scientific journals, magazines, and newspapers, collaborated in the writing of two textbooks, and published a number of little books and pamphlets on popular topics.

During the most active years of his life he was appointed to numerous offices, among which were those of physician for diseases of the nervous system, Boston Dispensary, United States examining surgeon for pensions, city physician of Boston, physician for nervous diseases at the Boston City Hospital, and in 1902, Professor of Diseases of the Nervous System, Tufts Medical School. In 1914 he became consulting physician to the Boston City Hospital.

In 1906 he established the *Journal of Abnormal Psychology* which, in the surmises of some of his more prosaic colleagues, was to be composed of lurid "spook" articles. A little later he founded the American Psychopathological Association. Naturally he was a member of numerous other scientific societies and president of some of them. In 1910 he delivered a course of lectures on abnormal psychology at the University of California, and received the honorary degree of LL.D. from Tufts College. Time after time he read papers at international congresses, and in 1924 lectured on subconscious phenomena at the Universities of Oxford, Cambridge, Edinburgh, and London.

In April, 1925, in recognition of his seventieth birthday and as a testimonial of his scientific work, *Studies in Personality: In Honor of Morton Prince* was published by a number of his colleagues in America and in Europe to whom he had endeared himself.

Prince's temperament was marked by a most contagious ebullience conveyed in

every gesture and expression of his life, whether he was playing with his two children at their summer home in Nahant, discoursing on the delights of yachting to a circle of young friends, elucidating some intricate point in the co-consciousness of B.C.A. before a class of students, or discussing world affairs with his contemporaries at the Century Club. He was alive from sole to crown: always ready to adventure without needless preliminaries upon any enterprise that appealed to his imagination. He had a mind prepared for the chance that comes but once, leaning forward, as it were, to seize whatever promise destiny had to offer. The opportunity might be to engage in a new experiment devised by his ever-fertile mind, to board a steamer for a trip to Europe, or to write an editorial letter to the Boston *Herald* expounding his view of the Sacco-Vanzetti trial.

As ground for this largesse of mind and spirit was a sturdy athletic body initially hardened by college football and kept vigorous throughout his life by his favorite outdoor hobbies, riding and yachting. So unaccustomed was he to physical incapacity that in his later years, with reckless defiance of the inroads of senescence, he would sometimes push himself to the very margin of exhaustion. He so hated sickness that he dismissed a doctor who prescribed an uninterrupted rest in bed. "I shall be my own physician," he announced.

Prince was a magnum of sparkling Moselle, irrepressibly social. In a leisure hour, gaily arrayed—with a flowing foulard tie of many hues, a carnation in his buttonhole and a glint in his eye—he would jauntily sally forth to seek the company of his friends, intelligent men of a practical or scientific turn of mind and spirited, vivacious women. He had a genuine flair for entertaining, with the gift of making a guest feel instantly at home, irrespective of what underlying divergencies of opinion might exist. This was his manner as host of the "Olympians," a group of psychologists and philosophers who met from time to time at his home to discuss questions of general scientific import. The State government, recognizing his talent for such a role, appointed him to serve on the committee to receive the Japanese mission in 1917 and to welcome Marshal Foch and General Diaz in 1921.

In view of the father's experience in government, it might have been foreseen that his most energetic son would, in his turn, become involved at times in politics, local, national, and international. Prince played an active part as secretary of the Public Franchise League and, besides other civic undertakings, served in 1909 as chairman of "The Committee of One Hundred" in the campaign which resulted in securing the present Boston city charter.

After the outbreak of World War I he became exercised, as did one of his four brothers, Frederick H. Prince, over America's nonparticipation and, since with him an emotion was tantamount to a compulsion to act, he did everything in his power to arouse the public out of what he judged to be an ignoble lethargy. He made many speeches and in 1916 initiated, among other propositions, the "Address (of the 500 Americans) to the People of the Allied Nations." He acted as chairman of the Serbian Distress Fund, and in 1916 he visited Japan, where, acting upon advice from the British Embassy, he spoke in behalf of the Allied cause. Later, in Europe he served in various capacities, visiting hospitals, prison camps, and munition factories.

After America's declaration of war he was commissioned (1918) by the Governor of Massachusetts to serve as manager of the Massachusetts Soldiers and Sailors Information Bureau in Paris, and after the armistice he attended the Paris Peace Conference as special correspondent of the Boston *Herald*. For these and other services he received numerous decorations, among which was the Cross of the Legion of Honor (France) in 1919.

Dr. Prince possessed many of the attributes of a knowledgeable and worldly *bon vivant*. He had no taint of limited professionalism and was always, in a sense, even in his best scientific work, a splendid amateur with a fresh and robust outlook. He was

so diffuse in his enthusiasms, indeed, that his friends rarely thought of him as a great specialist. Had there been as ingredients of his nature a pinch of artistic sensibility and a measure of the finer cultural discriminations of his wife, he might have been what is so rare in America, a humanist of parts. But genes and fortune bent him to another course—a course of immense activity and expansion, which permitted little inner life. He could partake of the simpler emotions of his friends, but in his experience there were no dark shadows, no all-pervading skepticisms, no tragic depths, and hence with age he did not ripen to a mellow wisdom, but remained youthful and zealous and experimental and optimistic. And at the end he did not come to death as a shock of corn to his season, but death came to him as a stroke to an old warrior still flushed with anticipations of even greater conquests. "There is so much to be done," he said on his deathbed, "I have so many plans."

From the psychoanalytical movement Prince remained apart. Besides a number of personal deterrents, there were his insistence upon scientific rigor and a certain obtuseness to the more mysterious, subtle, and poetical facts of subjective experience to sway him to an antipathetic attitude towards the far-reaching speculations of Freud and Jung, couched as they so often were in metaphorical and unreferential language. Thus he fell out of the mainstream of contemporary thought.

But there was compensation in the offing: in his seventy-second year, he was appointed Associate Professor of Abnormal and Dynamic Psychology at Harvard College. To Prince himself was presented the endowment for this educational venture—a venture which he did not wish to have pursued at the Medical School but rather within the fostering atmosphere of the College, where research and therapy might proceed unharassed by the exigencies of a general hospital service. Here for two years this veteran of so many psychological experiments lectured to large classes of young men—men who were studying the subject as preparation for medicine or as part of their postgraduate work in psychology or because of its bearing upon such other vocations as theology or law. At this time Prince, whose intellect had lost some of its former clarity and who was in the habit of repeating, "I cannot tolerate a man with a muddy mind," was yet able, by the undiminished amplitude of his enthusiasm, to infect his students with sparks of his own zest for the discipline of psychology and to give them some sense of standard in experimental methodology. The students relished his theatrical performances and liked him as an affable teacher, approachable and generous with his talk. Like a good flagon he was always full.

Morton Prince's ambition was to make Harvard a great center of psychopathology. He wanted to establish a group who would engage in fundamental research and who would train men to carry it on at other centers.

As a consequence of his vision and of his enterprise, there still stands at 64 Plympton Street, Cambridge, as an integral part of the Harvard Department of Social Relations, a building that houses the investigative endeavors of a number of workers concerned with problems of personality. "La Salpêtrière is a monument to Charcot," Dr. Prince said before his death in 1929. "I want no other monument than the Psychological Clinic."

SOME CHARACTERISTICS OF AFFILIATION MOTIVATION[1]

ELIZABETH G. FRENCH AND IRENE CHADWICK

Personnel Research Laboratory, Air Force Personnel and Training Research Center

THE present study was designed to test several hypotheses concerning the nature of affiliation motivation. Shipley and Veroff (4) found that not only *S*s who had experienced rejection (men who had desired to be pledged to a fraternity but had not been), but *S*s who had undergone a sociometric procedure that did not emphasize rejection, gave significantly more responses indicating fear of rejection to Thematic Apperception Test pictures than did control groups. These results, plus the small number of TAT responses reflecting positive affect under either aroused or control conditions, led them to define affiliation motivation primarily in terms of concern over separation and to interpret it as stemming from the painful stimulus of rejection. The present authors propose a broader definition of affiliation motivation. Here it is defined as a desire to establish and/or maintain warm and friendly interpersonal relations. It is suggested that both approach, or goal, responses toward affiliation and avoidance responses toward rejection are components of affiliation. Two hypotheses are related to this line of reasoning. The first is that an increase in both components will result from a procedure which maximizes affiliation cues in the environment without emphasizing either aspect. The second is that total level of motivation will not be related to acceptance, or popularity, but that the relative goal or threat orientation of an *S* will be, with popular *S*s being more goal- and less threat-oriented than unpopular ones.

In line with earlier findings for achievement motivation (2), the additional hypothesis is proposed that the *S*'s internal motivation level will be a determinant of the level reached in the experimental situation and those *S*s with high internal affiliation motivation will be more affected by the environmental cues than will those whose internal motivation is low.

The final predictions concerned the effect of need for affiliation on the accuracy of the *S*'s estimate of his popularity in the group. Since his standing is of a good deal of importance to him, the highly-motivated *S* might be expected to be more aware of the degree to which he is accepted than would the *S* to whom acceptance by others is of little importance. Also, since popularity is a valued attribute to *S*s with high affiliation motivation, such *S*s would be expected to rate themselves higher than *S*s who put little value on popularity.

METHOD

Measure of affiliation motivation. The same instrument used in the achievement-motivation study (2) and described in more detail elsewhere,[2] was used to measure affiliation motivation. The test consists of single-sentence descriptions of behavior which are presented as typical of hypothetical individuals with whom the *S* can identify. A sample item is, "Tom always lets the 'other fellow' win." The *S*s are instructed to "explain" the behavior. The assumption is, of course, that an *S* with a high level of a given motivation, in this case affiliation, will project that motivation into another's behavior when the cause of that behavior is unclear. Items were selected which varied in the extent to which they had been found to elicit explanations in terms of the affiliative motive and which drew explanations in positive (approach) or negative (avoidance) terms about equally often. Illustrative responses of both types to the item quoted above are: "So the other fellow will feel good toward him," and "He's afraid he'll lose a friend if he wins." The scoring categories used are similar to those developed by McClelland, *et al.* (3) for scoring achievement-oriented responses to the TAT. It is possible to determine a total score, a positive score, and a negative score for each *S*. Previous work by the author and others (2, 3) has demonstrated that this kind of approach has validity for the measure of motivation. The test is presented as a Test of Insight which measures the ability to understand the behavior of others.

Subjects. The *S*s were 151 male students in the Officer Candidate School at Lackland Air Force Base, the members of 6 flights. The data reported are based on 144, selected according to a procedure to be de-

[1] This investigation was carried out under the Air Force Personnel and Training Research Center in support of Project No. 7704. Permission is granted for reproduction, translation, publication, and use or disposal in whole or in part by or for the United States Government. Portions of this paper were read at the 1955 meeting of the Midwestern Psychological Association.

[2] Unpublished draft. Copies may be obtained from the senior author.

scribed. A flight averages about 25 men and is the basic living and working group for the duration of the six-months course. The men live, attend classes, study and, usually, spend what leisure time they have together.

Procedure. Two experimental sessions were required. In the first, a regularly-scheduled testing period, the *S*s were administered one form of the Test of Insight by regular test administrators. The situation was a classroom one, providing relatively few affiliation cues. The affiliation-motivation scores obtained under these conditions were assumed to reflect the *S*'s internal level of motivation. When the *S*s had completed the test they were asked to list the three or four men in their flights whom they liked the best and the three or four whom they liked the least. This was done both to provide a basis for part of the procedure in the second session and to provide a measure of popularity. The distributions of the number of choices and rejections received were comparable from flight to flight, permitting the assumption that a given score indicated the same level of popularity in all flights and allowing matching across flights in setting up the experimental groups for the second session.

Both the distribution of affiliation-motivation scores and that of popularity scores were dichotomized at the median. The *S*s who scored above the median on the Test of Insight were designated the high internal-motivation group and those who scored below, the low internal-motivation group. A similar designation was given the *S*s above and below the popularity median. Since there was no correlation between affiliation-motivation and popularity scores and since there were a few extra *S*s it was possible to form 4 subgroups such that each contained 36 *S*s with one of the four possible combinations of high-low motivation and high-low popularity scores. Half of each subgroup was then assigned randomly to the aroused condition and half to the control condition. The aroused and control groups did not differ significantly in either mean affiliation-motivation level or popularity level as demonstrated by *F* ratios of .10 and .01 respectively.

The aroused condition. The group was assembled about one month after the first session and a civilian *E* first spoke a few paragraphs describing some of the pleasant aspects of being well liked and pointing out that one factor affecting an individual's popularity was his sensitivity to others' reactions to him. The *S*s were reminded of the nominations they had made in the previous session and told that they were now to predict the group reaction to them by stating, on a 4-point scale, their estimate of their popularity with respect to the rest of the flight, and by listing the names of the five men they thought probably named them as best liked and five who probably named them as least liked. They were also asked to state, on a 4-point scale, how important it was for them to be well liked. The remaining group, the control or non-aroused group, was given a test of military attitude during this period.[3]

TABLE 1

MEAN TOTAL, POSITIVE, AND NEGATIVE SCORES ON AFFILIATION MOTIVATION FOR THE EIGHT SUBGROUPS

	Aroused				Nonaroused			
	Popular		Unpopular		Popular		Unpopular	
	M	*SD*	M	*SD*	M	*SD*	M	*SD*
Total								
High motiv.	6.72	2.29	5.50	2.12	4.29	1.56	4.17	1.92
Low motiv.	3.67	1.51	4.39	2.48	3.50	1.60	3.44	1.37
Positive								
High motiv.	3.83	1.61	2.89	1.41	2.61	1.30	2.00	.94
Low motiv.	2.56	1.41	2.33	1.28	2.39	1.05	2.28	1.04
Negative								
High motiv.	2.39	1.55	2.39	1.60	1.44	1.21	1.61	1.63
Low motiv.	.67	1.07	1.83	1.71	.72	1.04	1.17	1.53

The Test of Insight was presented immediately following these conditions. It was introduced as part of another experiment, unrelated to the previous discussion. The papers were alphabetized without regard to experimental group and scored by the authors independently. Scoring agreement was 85 per cent. Agreement on the remaining 15 per cent was reached easily after discussion. The scorers were unaware of the group from which any *S* came.

RESULTS

The hypotheses concerning the effects of the arousal conditions, popularity and internal need on the number and kind of affiliation responses were tested by analyses of variance of the scores for the various groups and by chi-square comparisons of the proportion of positive and negative responses. Table 1 presents the means and standard deviations of the total, positive, and negative scores for the subgroups. Table 2 summarizes the analy-

[3] At this point in the procedure one-third of the *S*s in each group, equated on basis of motivation and popularity scores, was told they were the men most often named as best liked, one-third, that they were the ones most often named as least liked, and the remaining third was given no information about group standing. This was done with the intention of providing different degrees of feeling of acceptance or rejection in order to test the hypothesis concerning the effect of this variable on the kinds of responses made. It became apparent immediately that the *S*s failed to believe what they were told, however, with some stating their disbelief audibly. These groupings were ignored in the analyses, as a result, and the *S*s popularity score was used as the basis for assuming feelings of acceptance or rejection. A biserial correlation computed between the dichotomized estimates of popularity obtained from the aroused *S*s and their actual popularity scores was .78, indicating a fair degree of congruence between felt popularity and actual popularity.

TABLE 2

SUMMARY OF ANALYSES OF VARIANCE

Source of Variation	df	Total		Positive		Negative	
		MS	F	MS	F	MS	F
Arousal	1	53.78	14.34**	12.25	7.16**	12.25	5.59*
Internal motivation	1	72.25	19.27**	7.11	4.16*	23.36	10.66**
Popularity	1	1.00		8.03	4.70*	9.00	4.11*
Arousal × Motivation	1	16.00	4.27*	8.03	4.70*	5.11	2.33
Arousal × Popularity	1	.24		.45		.25	
Motivation × Popularity	1	9.00	2.40	3.36	1.96	4.69	2.14
A × M × P	1	8.03	2.14	.11		.67	
Within groups (error)	136	3.75		1.71		2.19	

* Significant at .05 level.
** Significant at .01 level.

TABLE 3

POSITIVE AND NEGATIVE RESPONSES AS A FUNCTION OF EXPERIMENTAL VARIABLES

	Positive	Negative	χ^2	p
Aroused	209	131	1.05	—
Nonaroused	167	89		
Popular	205	92	7.75	.01
Unpopular	171	128		
High motivation	204	141	5.79	.02
Low motivation	172	79		

ses of variance. It is clear that the arousal condition increased the level of affiliation motivation by causing an increase in both positive and negative reactions. On the other hand, there was no difference between the popular and unpopular groups in over-all motivation level. But popular *S*s did make significantly more positive responses, and unpopular *S*s more negative ones. These data support the hypotheses that increasing the environmental cues relevant to affiliation would increase motivation level without changing proportion of approach and avoidance responses, and that popularity level does not affect over-all motivation level but does affect the orientation of the *S*. The chi-square analyses in Table 3 present further supporting evidence. They show that the arousal condition did not affect the proportion of positive to negative responses but that popularity level caused differences significant at the .01 level. These results lend validity to the definition of affiliation motivation which includes both approach and avoidance components.

The analyses in Table 2 also show that internal motivation level was a significant variable in determining the level reached in the experimental situation. Those *S*s who had scored above the median on the original test, when affiliation cues were at a minimum, tended to have scores above the median in the experimental situation, and vice versa. In addition, for over-all level and for positive responses there was a significant interaction between the arousal conditions and the original need scores, suggesting that those *S*s who have high internal-affiliation motivation are more responsive to environmental stimulation designed to increase that motivation. One finding was contrary to prediction. The interaction effect, although in the expected direction, was not significant for negative responses. As the chi-square (Table 3) for the proportion of positive and negative responses for *S*s high and low in internal need suggests, *S*s with high internal motivation have a somewhat greater fear of separation with or without environmental arousal of motivation.

The relationship of motivation level to accuracy of estimate of popularity was examined using the data from the aroused group. These *S*s had been asked to place themselves in the group on a 4-point scale of popularity. In fact, all but 3 of the 72 *S*s selected one of the two middle alternatives. The estimates were therefore dichotomized. Table 4 gives the frequencies of above-average and average estimates according to popularity level and affiliation-motivation level. The chi-square technique applied to the distribution of average and above-average estimates according to affiliation-motivation level yields a value of 4.02 which is significant at the .05 level. Apparently *S*s with high affiliation motivation do tend to rate themselves above average in popularity more frequently than *S*s low in such motivation. Biserial correlations computed for popularity score against popularity estimate yield values of .88 for the highly-motivated group and .61 for the group low in motivation. This difference is in the predicted direction but does not reach usual standards of significance, possibly due to small number of *S*s low in affiliation motiva-

TABLE 4

POPULARITY ESTIMATE AS A FUNCTION OF AFFILIATION MOTIVATION

	Estimate "Above Average"		Estimate "Average"	
	High Motivation	Low Motivation	High Motivation	Low Motivation
Popular	13	8	3	11
Unpopular	3	0	17	17
Total	16	8	20	28

tion who rated themselves above average. Comparison of the popularity-score means for the *S*s who estimated themselves average in the two groups indicates that the low-need *S*s who estimate themselves average are actually more popular ($t = 2.85$) than are high-need *S*s who rate themselves average. The data present some evidence for believing the *S*s with high and low affiliation motivation behave differently with regard to estimating their standing in the group.

DISCUSSION

In general the results support the hypothesis that affiliation motivation is more than just fear of separation as proposed by Shipley and Veroff. A later study by Atkinson, Heynes, and Veroff (1) which appeared after the data reported here had been collected confirm this interpretation. In many ways the present study confirms findings of Atkinson, *et al.* Since duplication of results in such an area as the one under investigation is of considerable interest it seems worthwhile to discuss the points of similarity between the two studies.

Atkinson, Heynes, and Veroff suggested that one reason the earlier study of Shipley and Veroff failed to obtain positive, or approach, responses was that the TAT pictures used were too suggestive of interpersonal problems to permit them. The use of more commonplace pictures elicited a substantially greater number of positive responses. In the present study the items were selected partly on the basis of their ability to elicit both types of responses and again both types were obtained.

The response categories developed for the present experiment were similar to those of Atkinson, *et al.*, permitting direct comparison of discriminating ability. Of the 12 categories used in the present study, 6 appeared to duplicate Atkinson's; in 2 cases, 2 of ours could be combined in such a way that they approximated 2 more; and number of items scored per *S* was tabulated to duplicate an additional category. For these 9 categories our results could be compared with Atkinson's with respect to the extent to which they discriminated between the aroused and nonaroused groups in the two studies. Despite differences in procedure and in the instruments used, 6 of the 9 categories yielded similar results for both studies (Table 5). When the chi square obtained by Atkinson for a seventh

TABLE 5

AGREEMENT OF SCORING CATEGORIES OF TWO EXPERIMENTS IN DISCRIMINATING BETWEEN AROUSED AND CONTROL CONDITIONS

French and Chadwick			Atkinson, Heynes, and Veroff		
Category	χ^2	p	Category	χ^2	p
Items scored	+9.02*	.001	Imagery	+12.96	.001
Expectation of success	+4.76	.05	Positive anticipatory goal state	+5.42	.01
Goal attainment + positive affect	+4.40	.05	Positive affective state	+3.49	.05
Desire for goal	−.28	—	Need	+1.16	—
Activity to avoid failure	−.75	—	Unsuccessful instrumental act	+.49	—
Expectation of failure	+1.38	—	Negative anticipatory goal state	+.49	—
Goal-directed activity	+1.18	—	Successful instrumental act	+3.04†	.05
Personal qualifications preventing goal attainment	+4.84	.05	Personal obstacle	+.18	—
Failure + negative affect	+3.61	.05	Negative affective goal state	+.64	—

* Positive sign before χ^2 indicates that frequency of category was greater in the aroused group than in the control; a negative sign the reverse.

† Becomes 2.01 when corrected for small cell frequencies.

category is corrected for small-cell frequencies it drops below the level of significance and becomes comparable in that respect to the one we obtained for the same category. Two of our categories, Qualifications preventing goal attainment, and the combined Failure plus Negative affect to failure categories, discriminated between the aroused and non-aroused groups where their counterparts in the Atkinson study failed to do so. This degree of agreement in two such different experiments lends considerable validity to this approach to motivation measurement.

There is one point on which the present results differ from those of both the previous studies. Both the earlier studies report negative correlations between affiliation-motivation scores and popularity. Such were not obtained in the present experiment. Analyses show no relationship between either the first motivation score and popularity ($r = .08$) or the scores obtained in the second session and popularity ($r = .10$). As previously pointed out, however, there is a negative relationship between popularity and number of *negative* or threat-oriented responses. This finding corresponds to the Shipley and Veroff results, since their affiliation score was based primarily on negative responses, but not to those of Atkinson, Heynes, and Veroff.

SUMMARY

A measure of affiliation motivation was given under conditions designed to increase the level of that motivation and under neutral conditions. The results, which confirmed the hypotheses proposed, indicated that:

1. Increasing affiliation cues in the environment increases the level of both goal-oriented and threat-oriented responses.

2. Popularity is unrelated to level of affiliation motivation but does determine the extent to which the *S* is goal or threat oriented.

3. Those *S*s with high internal affiliation motivation are more responsive to external affiliation cues than are *S*s with low internal motivation.

4. Those *S*s with high affiliation motivation tend to estimate their popularity level more accurately and to estimate it higher than *S*s with low affiliation motivation.

In addition points of similarity between the present study and work of previous investigators are discussed.

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LEARNING AND TWO KINDS OF ANXIETY[1]

ROBERT E. SILVERMAN AND BERNARD BLITZ
New York University

RECENT studies involving anxiety as an independent variable have differed with respect to the definition of anxiety. For some investigators, anxiety is defined with reference to the antecedent conditions, (2, 7). That is to say, anxiety is experimentally induced by introducing some form of noxious stimulation. Other studies have focused upon the properties of anxiety, defining it in terms of response measures such as are obtained from systematic observation or from psychometric procedures (3, 4, 7).

The present study represents an attempt to deal with both forms of definition by investigating some effects of experimentally induced anxiety and its relationship to anxiety defined in terms of responses to the Taylor Anxiety Scale (8). A situation involving threat was chosen as an appropriate technique for the experimental induction of anxiety since it is the one recurring concept in both laboratory and clinical considerations of anxiety.

Two kinds of threat techniques were studied, an avoidance condition and a nonavoidance condition. In the avoidance condition, an *S* is given instructions which imply that he can avoid the threatened event by performing a given task adequately. No terminating response is possible in the nonavoidance situation in which the instructions give no hint as to the reasons for the threatened event. Since there is no suggestion of any reinforcement under this condition, protective responses which are incompatible with the given task may be elicited and consequently disrupt performance. Evidence for this protective response hypothesis comes from a recent study by Rosen (6), in which he found that nonavoidance threat disrupted a perceptual task.

If the persons who obtain low anxious (LA) scores are those who have learned appropriate defenses against threat stimuli, one would expect their performance to be improved by an avoidance condition but disrupted by a nonavoidance condition. If, on the other hand, high anxious (HA) scores are obtained by persons who have not developed adequate defense techniques, then such people should react by falling back on their typical behavior mechanisms, however inappropriate they may be. Thus, for the HA *S*s, the avoidance and nonavoidance conditions would not be expected to elicit different kinds of responses.

The experimental method employed here utilized two measures of performance. The central or relevant task involved serial rote learning, while the peripheral or irrelevant task was concerned with incidental learning. Both measures were included so as to check the possibility that impairment in a relevant task under threat conditions might be related to the occurrence of task irrelevant responses such as would produce incidental learning.

PROCEDURE

One hundred and thirty students in elementary psychology were given the Taylor Scale of Manifest Anxiety (original form). The *S*s whose scores appeared in the upper one-third of the obtained distribution were considered as high anxious (HA) and those in the lower one-third as low anxious (LA). Using this procedure, a total of 80 *S*s was obtained. The HA *S*s were randomly assigned to a so-called shock or a nonshock group, each group consisting of 20 *S*s. The shock group was further subdivided into two equal groups, an avoidance and a nonavoidance group. The LA *S*s were assigned to two groups in precisely the same manner. No actual shock was ever applied; it was only threatened.

All *S*s were given a series of five preliminary training trials during which time they were instructed to learn a list containing six simple three-letter words which appeared in the opening of a modified Hull-type memory drum. The drum was divided into three sections, the center section containing the words and the left section containing a one-digit number. The right section was always blank. Each section was separated from the other by an area 2 cm. wide. The number which appeared in the left section was 6 cm. from the word in the center section.

During the preliminary series and the subsequent learning trials, the drum rotated every two seconds with every other rotation presenting a word in the center section and every rotation presenting a number in the left section.

Following the preliminary training, the experimental conditions were introduced. All *S*s were instructed to

[1] A part of this paper was read at the Eastern Psychological Association meeting at New York in 1954.

TABLE 1

MEAN ERROR SCORES FOR ALL GROUPS DURING LEARNING AND RELEARNING

Measure	Group	Condition		
		Control	Avoidance	Nonavoidance
Learning (Trials 1–10)	HA	45.50	39.90	43.20
	LA	42.05	31.80	52.40
Relearning (Trials 11–15)	HA	10.90	8.60	8.50
	LA	7.15	2.80	14.90

learn a list containing 8 low-association nonsense syllables by the anticipation method. The manner of presentation was the same as that used in the training. The syllables appeared in the center section and two-digit numbers appeared in the left section. If an *S* asked about the numbers during the preliminary or the learning series, his scores were not considered.[2] Following 10 learning trials, each *S* was given a brief rest during which time he was asked to select from a matrix of 60 two-digit numbers, the numbers which had appeared on the drum. After the test for incidental learning, the *S*s were given five additional trials in learning the nonsense syllables. During these last five trials only the center section of the drum was exposed.

The *S*s who had been assigned to a shock condition had electrodes placed on their legs. The *S*s in the avoidance group were instructed, "During the experiment, you *may* receive a shock." The *S*s in the nonavoidance groups were told "During the experiment, you *will* receive a shock." The electrodes were removed during the test for incidental learning and were not used again for the final five trials. As indicated, no shock was actually delivered in any case.

RESULTS

The results of the preliminary training series indicate that the six groups were similar with respect to initial learning ability. There were no statistically reliable differences among the various groups before the experimental conditions were introduced.

The nonsense syllable data were analyzed at two stages of learning. Error scores were computed for the first ten acquisition trials during which time the shock conditions were invoked, and for the five relearning trials (Trials 11–15) when the shock threat was not present.

The mean error scores presented in Table 1 reveal that at each of the two stages of learning the experimental conditions affected the HA and LA groups differently. The LA *S*s show a diminution in errors under the avoidance condition and an increase in errors under the nonavoidance condition. The scores of the HA *S*s, however, are not reliably affected by either of these conditions.

[2] Five *S*s were dropped on this basis.

TABLE 2

ANALYSIS OF VARIANCE OF THE LEARNING AND RELEARNING SCORES

Source	Learning			Relearning		
	Sum of squares	*df*	*F*	Sum of squares	*df*	*F*
Experimental conditions	1504.10	2	3.808*	11.384	2	4.616*
Anxiety scale	42.08	1	.213	1.935	1	1.569
Scale × Conditions	828.17	2	2.097	9.358	2	3.794*
Within groups	14612.45	74		91.246	74	
Total	16986.80	79		113.925	79	

Note.—The error score variances for the relearning trials were not homogeneous (Bartlett's test was significant at the .01 level). A square root transformation was introduced so as to use the analysis of variance.

* Significant at the .05 level.

TABLE 3

INCIDENTAL LEARNING SCORES FOR ALL GROUPS

Group		Mean	*SD*	Median	Range
Control	HA	4.30	2.81	4.71	1–9
	LA	4.75	2.19	5.43	1–7
Avoidance	HA	4.30	2.81	4.75	2–7
	LA	5.00	1.80	5.50	3–7
Nonavoidance	HA	4.70	3.09	4.50	2–8
	LA	4.70	1.21	5.33	3–6

The analysis of variance for the error scores is presented in Table 2. The tests indicate that the differences among the means of the experimental conditions were reliable at the .05 level of confidence for both stages of learning. The interaction, which reflects the differences in response to threat of the HA as compared to the LA groups, was significant only during the last five trials.

In Table 2 it can be seen that the anxiety scale groups are not reliably different from each other. As a further test, *t* ratios were computed between the control group means. Neither the *t* of .716 for the learning trials nor the *t* of 1.53 for the relearning trials was significant for 38 *df*.

The incidental learning scores are presented in Table 3. The distributions of these scores were markedly leptokurtic, and as a result, normal curve statistics could not properly be

applied. Inspection of Table 3 reveals that the medians of the HA groups are consistently smaller than the LA groups. A chi-square technique using the median test (5) was applied to test the differences in incidental learning between the HA and LA groups and among the experimental conditions. The chi square for the difference between HA and LA was 5.01, significant at better than the .05 level of confidence for 1 *df*. No reliable difference among the experimental conditions was found; the chi square was 1.11.

DISCUSSION

The results of this study demonstrate that *S*s who obtain relatively high scores on the Taylor Anxiety Scale do not respond to threat as do the low score *S*s. The latter group's performance is improved by an avoidance threat and impaired by a nonavoidance threat. These data suggest that anxious persons do not respond adaptively to threat. It appears that their anxious responses reflect either inappropriate defenses or defenses which are so firmly entrenched as to obviate sudden changes in response to the relatively mild threats of the laboratory situation.

The incidental learning data suggest that the responses of the HA *S*s involve a type of fixed attention such that their behavior suffers from a lack of variability and exploration. Support for this interpretation comes from two recent studies. Cohen (1), using Taylor Scale scores, found that HA *S*s showed little variability in their behavior (as compared to their LA controls) when they were presented with an unstructured task. Maltzman, Fox, and Morrisett (4), in comparing the performance of high and low anxious *S*s, found that the high anxious *S*s were less likely to shift from a "dominant set" to alternate responses when attempting to solve the Luchins water jar problems. These authors considered the increased set as reflecting the drive properties of anxiety.

In the experiment reported here, however, the drive concept would not seem to be sufficient to account for the obtained interaction between test-defined anxiety and the experimental threat conditions. It would appear to be more in line with these data to interpret test-defined anxiety as indicating different techniques of responding rather than as merely different levels of drive.

SUMMARY

This study investigated the effects of threat and test-defined anxiety on rote learning. It was found that persons who obtain high scores on an anxiety inventory were little affected by threat, but that the performance of the low score persons was impaired by a nonavoidance threat and improved by an avoidance threat. The fact that the high score *S*s showed little incidental learning was interpreted as lending support to the position that these *S*s have developed limited ways of responding such that they manifest a kind of fixed attention.

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INTERPERSONAL TRUST AS A FACTOR IN COMMUNICATION[1]

GLEN D. MELLINGER

Survey Research Center

IT IS axiomatic that the way two people feel about each other has an important bearing on what they communicate to each other and on how they respond to what is communicated. This paper explores the more specific proposition that an individual is likely to distort his own attitudes in communicating them to people he distrusts.

By distrust is meant the feeling that another's intentions and motives are not always what he says they are, that he is insincere or has ulterior motives. A person who is distrusted, in this sense, is likely to be regarded as potentially threatening, especially in an organizational setting where individuals are highly interdependent. Attitudes toward him may therefore be more or less tinged with anxiety, depending on his power in the organization. To the extent that this is so, a primary goal of communication with a distrusted person becomes the reduction of one's own anxiety, rather than the accurate transmission of ideas.

Horney's typology of defense reactions in terms of withdrawal, compliance, and aggression (2) suggests that distrust may have any of several possible consequences for communication, each of which is designed to minimize anxiety. Given the necessity (or desirability) of communicating with individual A about issue X, B may be vague or *evasive* about his own attitude (withdrawal).[2] He may try to put himself in a more favorable light with A by minimizing actual disagreement; communications of this sort may be described as *compliant*. Or he may express resentment toward A by exaggerating disagreement; his communications may be *aggressive*. Any of these mechanisms will result in some distortion of B's attitude as he transmits it to A.

B may find it advisable, of course, to communicate accurately when he distrusts A. It is assumed only that distrust reduces the likelihood of accurate communication.

In the present research situation, it was impossible actually to observe the communication process itself and to note distortions directly. In order to surmount this shortcoming, a procedure was adopted based on the following reasoning. If B transmits to A distorted information about his attitude, A's *perceptions* of B's attitude will suffer accordingly. Therefore we used A's perceptions as an index of the accuracy of B's communication to A—even though we recognized that perceptions of another's attitudes are subject to other kinds of distortions as well.

Consider, then, a situation in which: (*a*) A knows several B's, each of whom has expressed (to the researcher) an attitude about X; (*b*) A has communicated with some B's about X, but not with others; (*c*) some B's have a high degree of trust in A, while others lack trust in varying degrees; and (*d*) A is asked to estimate the attitude of each B about X. To measure the effect of a B's distrust on A's perceptions, A's estimate may simply be compared with B's stated opinion, providing a measure of A's *accuracy* in estimating B's opinion. In addition, the theory that defense-motivated communications may be evasive, compliant, or aggressive suggests an additional measure—one which indicates whether A's inaccuracy takes the form of exaggerating or minimizing the distance between B's attitude and his own. Newcomb has called this

[1] This report is based on a dissertation submitted in January, 1955, in partial fulfillment of the requirements for the Ph.D. degree at the University of Michigan. The writer's doctoral committee included Dr. Theodore M. Newcomb, Chairman, and Drs. Robert L. Kahn, Daniel Katz, Donald C. Pelz, and Guy E. Swanson. The study, of which this project was a part, was conducted by the Human Relations Program of the Survey Research Center under contract with the National Institutes of Health, Public Health Service, of the Department of Health, Education, and Welfare, and was under the general direction of Donald C. Pelz, Study Director. Other results of this study are reported elsewhere (1). The research objectives of the Human Relations Program have been described by Likert (4).

[2] Newcomb's recent paper on communication (6) provides the theoretical basis for the present research. The theory assumes that X represents an object or issue of mutual importance to A and B, and that each has reason to concern himself about the other's attitudes in this area.

measure *perceptual displacement*. The chief interest here will be in the variance of displacement scores, high variance indicating that some estimates exaggerate actual disagreement while others exaggerate agreement. Note that low displacement variance need not signify accurate perceptions if, for instance, the communications of all the B's are compliant.

The major hypotheses to be tested are as follows: (*a*) taking first the B's who *trust* A, two consequences of communication may be predicted: first, A's estimates should be more accurate, on the average, than in the case of B's with whom there has been no communication; and second, the variance of the displacement scores should be lower than with no communication, that is, there should be fewer cases in which A drastically overestimates or underestimates agreement. (*b*) In the case of the B's who *distrust* A, on the other hand, communication serves neither to increase the accuracy of A's estimates nor to decrease the variance of the displacement scores. (i) By virtue of their distrust of A, these B's presumably have communicated their attitudes with some degree of inaccuracy. Thus it is hypothesized that A's accuracy in estimating these attitudes does not improve as a result of communication. (They may not be *less* accurate, necessarily, than estimates made without prior communication, since the latter also will tend to be inaccurate.) (ii) Similarly, since some B's are likely to have communicated evasively, while others are likely to have communicated aggressively, and so on, A is likely to have overestimated agreement in some cases and underestimated it in others. Consequently, the variance of his displacement scores for these B's should not be significantly lower than for the B's with whom he has not communicated.

METHOD

The present study was conducted in a large government organization devoted to medical research. (Throughout the paper this organization will be referred to as "The Medical Research Institute.") The population from which the data were obtained consists of 330 professional scientists engaged in laboratory research. Most of these scientists have at least one advanced degree in medicine, chemistry, physiology, psychology, or a related discipline, and their government status ranges from GS-9 to GS-15.

Preliminary scouting interviews revealed that a new major addition to the research program was about to be initiated at the Medical Research Institute, and several considerations led to its selection as a focus for the study of communication and consensus. For one thing, there had been widespread discussion among scientists about the program. For another, opinions differed considerably as to its long-run desirability. Some scientists were concerned that the organization would double in size within a few years. Others found cause for alarm in the expansion of the programs to embrace "clinical" or "applied" objectives, in contrast to the organization's previous concentrations on basic laboratory and field research.

In any case, most scientists were bound to be affected by the program in one way or another, and all were agreed about its importance, if not about the benefits which the "basic" research program would gain from it. Most respondents, it could therefore be assumed, were interested in or concerned about the attitudes of their colleagues in this area. At the same time, pressures to conform to group or organizational norms may have been relatively weak since the decision to introduce the program had been made at an earlier date, and since most of the laboratory scientists had not been involved directly in making the decision. By the same token, there may have been relatively little necessity for perceiving the attitudes of others correctly.

All data were collected by a written questionnaire which was designed to identify specific pairs of individuals within the organization (corresponding to the A and B of the theoretical notation) and to obtain from both members of each pair the following information: (*a*) their attitudes about the long-run consequences of the new research program; (*b*) their attitudes of trust toward each other; (*c*) their reports as to whether they ever had discussed the new program; and (*d*) their estimates of each other's attitude about the issue.

A "Personal Contact Checklist" for obtaining this kind of information in an ongoing organization had been used in an earlier Human Relations Program study directed by Jacobson (3, pp. 28–40), and a similar instrument was used in the present study. At one point in the questionnaire, respondents were asked to list the names of up to seven other people. The persons to be named included the respondent's chief, the person above the chief, any other person to whom the respondent reported, a colleague at his own level, and three people at various levels working under the respondent. Respondents were given explicit instructions as to whom they should name in order to minimize the likelihood that only those persons would be named who were liked best, communicated with most, and so on.

Respondents were then asked a series of questions about each of the persons they had named on the Personal Contact Checklist. The following question provided data for a measure of *communication*: "How often have you discussed with each of the following people the way the various resources of (the new research program) are to be allotted for various purposes?" Preliminary analyses indicated that the chief differences occurred between those who had discussed this matter (whether "once or twice," "a few times," or "many times") and those who had not discussed it at all. Accordingly, the present analysis distinguished

TABLE 1

RELATIONSHIP BETWEEN A'S ACCURACY IN PERCEIVING B'S ATTITUDE AND THE LEVEL OF ACTUAL AGREEMENT BETWEEN A AND B

A's Accuracy	Level of Agreement					Total
	Low			High		
	0	1	2	3	4	
High 4	1	5	5	28	40	79
3	1	7	21	64	13	106
2	3	5	25	3	4	40
1	2	13	0	0	1	16
Low 0	2	0	0	0	1	3
Total	9	30	51	95	59	244
Mean accuracy	1.67	2.13	2.61	3.26	3.53	

Note.—*F* test significant beyond the .001 level of confidence.

only between pairs which reported communication and those which reported no communication.

A measure of *interpersonal trust* was based on answers to the following question asked about each person: "To what extent do you have confidence in this person's intentions and motives? Do you feel he is always sincere in his dealings with others? Does he really mean what he says?" Since over one-half of the responses fell in the category indicating complete trust or confidence, the only distinction maintained was between these responses (*high trust*) and the remaining responses which signified less than complete trust (*low trust*).

A measure of *actual agreement* for each pair was based on a comparison of the responses of the two members to the following question: "In your opinion, is the basic research program . . . likely to benefit or to suffer as a result of the (new research program)?" Where the responses of the two members of a pair were identical, the pair was given an agreement score of 4, with maximum disagreement represented by a score of 0.

Finally, respondents were asked to estimate how each person named on the Personal Contact Checklist had answered the question just cited. Each estimate was then given an accuracy score and a displacement score. *Accuracy* scores were based on a simple comparison of A's estimate with the attitude actually expressed by B on his own questionnaire, and ranged from 4 (maximum accuracy) to 0 (maximum inaccuracy). *Displacement* scores were based on the degree to which A's estimate exaggerated or minimized the actual agreement between himself and B. They ranged from +4 (maximum overestimation of agreement) to −4 (maximum underestimation of agreement), with 0 representing no displacement. The scoring procedure is described in detail elsewhere (5, 81–88).

The data-collecting procedures gave rise to two additional problems. One involves a statistical "clustering" effect. The other grows out of the empirical relationship obtained between the measures of perceptual accuracy and actual agreement. Let us consider the latter first.

As Table 1 shows, the greater the actual agreement between A and B, the more likely it is that A will be accurate in estimating B's opinion. Although this finding is significant in and of itself, both theoretically and statistically, we are more concerned here with a problem of interpretation which grows out of it. An earlier analysis (not reported here) showed that communication tends to be associated with high agreement. Since high accuracy also is strongly associated with high agreement, a positive relationship between communication and accuracy is likely on a chance basis alone. The question is whether all or part of this relationship is due to the intervening link with agreement.

In order to hold constant the effects of actual agreement, the following procedure was adopted. The overall mean accuracy was computed separately for each level of agreement, and at each level all accuracy scores were expressed as *deviations* from the mean accuracy. Thus a score of zero, at any level of agreement, represents average accuracy for that level; a "plus" score represents above average accuracy; and a "minus" score represents below average accuracy. With these *adjusted* scores, any two or more adjacent levels of agreement can be combined, and the combined results will reflect the relationship between communication and accuracy undistorted by the relationship between accuracy and agreement.[3]

The second methodological problem concerns possible statistical errors due to the clustering of responses. Recall that each respondent was asked to estimate the attitudes of as many as seven others. The problem is, to what extent are A's several estimates statistically independent?

If each respondent provides many estimates, then, to the extent that his several estimates are not independent, clustering may pose a serious problem, and statistical compensation may be necessary. Since the correction formulas are time-consuming, it is desirable to know something about the *magnitude* of the error introduced by the failure to correct for clustering.

In fact, only four respondents gave as many as four estimates. Further, there is a determinate relationship between the estimated population variance of a sample computed with the appropriate corrections (s_e^2) and the estimated population variance computed assuming independence (s_t^2).[4] In the case at hand, it was found that by using the uncorrected formulas the error of the variance estimates would not exceed 3 per cent, and the standard errors would be too small only by 1.7 per cent. The uncorrected formulas were therefore employed.

[3] The adjustment procedure, in turn, makes it necessary to introduce certain corrections in computing statistical formulas. This problem is discussed in the dissertation (5, pp. 178–182). In the tables which follow, results are shown for the two highest levels of agreement combined and the three lowest levels combined, as well as for all levels of agreement combined.

[4] The relationship is: $s_e^2/s_t^2 = 1 + \text{rho}(a - 1)$, where rho is the intraclass correlation, and a is the average number of responses per individual (5, pp. 169–171).

RESULTS AND DISCUSSION

It has been suggested that if several B's distrust an A, some of the B's may communicate with A in such a way as to minimize actual difference (compliance); others may maximize or exaggerate actual differences (aggression); and still others may communicate vaguely or ambiguously (evasion). If so, the *variance* of A's displacement scores is not likely to decrease as a consequence of communication, and may even increase.

The relevant findings are shown in Table 2 for high and low levels of actual agreement and for all levels of agreement combined. Table 2 shows that: (*a*) When B's trust in A is high, then the displacement variance is lower for A's who have communicated than for A's who have not. (For all levels of agreement combined, the difference is significant at the .025 level.) However, (*b*) when B's trust in A is low, then there is no significant or consistent relationship between communication and the variance of A's displacement scores. These findings clearly bear out the predictions made earlier.

In Table 2 the relationship is also evident between B's trust in A and the displacement variance of A's estimates, controlling on communication. (*c*) When A and B have communicated about X, the variance of displacement scores is substantially lower for trusted than for distrusted A's (significant at the .001 level of confidence for all levels of agreement combined). However, (*d*) in the absence of communication between A and B about X, there are no significant differences between the displacement variances for trusted as compared with distrusted A's.

TABLE 2

RELATIONSHIP BETWEEN COMMUNICATION AND VARIANCE OF A'S PERCEPTUAL DISPLACEMENT SCORES (Controlling on B's trust in A)*

	Communication		p of Diff.
	No	Yes	
A & B agree†			
B's trust in A			
Low	1.62 (7)‡	1.21 (34)	—
High	1.02 (23)	.57 (90)	.05
p of diff.	—	.01	
A & B disagree§			
B's trust in A			
Low	1.43 (8)	1.69 (31)	—
High	1.24 (18)	.76 (33)	—
p of diff.	—	.025	
Total			
B's trust in A			
Low	2.07 (15)	2.13 (65)	—
High	1.71 (41)	.93 (123)	.025
p of diff.	—	.001	

* The variance measure shown here is the estimated population variance (s^2) which is defined as: $s^2 = \Sigma x^2/(N-1)$. Significance levels are determined by F ratio: $F = s_a^2/s_b^2$.

† Or disagree by one response category.

‡ The figure in parentheses is the number of cases on which s^2 is computed.

§ By two or more response categories.

TABLE 3

RELATIONSHIP BETWEEN COMMUNICATION AND A'S ACCURACY*

	Communication		p of Diff.
	No	Yes	
A & B agree			
M Accuracy:	−.24 (30)	+.06 (124)	.025
A & B disagree			
M Accuracy:	−.02 (26)	.00 (64)	—
Total			
M Accuracy:	−.14 (56)	+.04 (188)	—

* Accuracy means shown here are based on the adjustment procedure described in the text.

† Levels of significance in Tables 3–5 determined by two-tailed t test of difference between means.

These findings support the theory that if B is motivated to communicate with A, and if B distrusts A, then he will communicate in such a way as to conceal from A information about his own attitudes toward an issue, X. Under these circumstances, the displacement variance of the estimates made by a group of A's will not tend to decrease as a consequence of communication. Instead, there will continue to be some estimates which underestimate or overestimate actual agreement.

However, low displacement variance does not necessarily signify a high degree of *accuracy*. An A could make a set of estimates in which he uniformly overestimates actual agreement. These estimates would all have positive displacement scores, the variance of these scores would be low, and yet their average accuracy also would be low.

Is communication, in and of itself, associated with high accuracy? Table 3 suggests that the answer depends on whether A and B actually agree. (*e*) When A and B *agree* (or disagree by only one response category), then accuracy is higher with communication than

TABLE 4

RELATIONSHIP BETWEEN COMMUNICATION AND A'S ACCURACY
(Controlling on B's trust in A)

	Communication		p of Diff.
	No	Yes	
A & B agree			
B's trust in A			
Low	−.44 (7)	−.06 (34)	—
High	−.19 (23)	+.10 (90)	.05
p of diff.	—	—*	
A & B disagree			
B's trust in A			
Low	+.50 (8)	−.10 (31)	—
High	−.24 (18)	+.08 (33)	—
p of diff.	.10	—	
Total			
B's trust in A			
Low	+.06 (15)	−.08 (65)	—
High	−.21 (41)	+.09 (123)	.01
p of diff.	—	—	

* For complete agreement only, this difference is significant at the .10 level.

TABLE 5

RELATIONSHIP BETWEEN B'S TRUST IN A AND A'S ACCURACY, WHEN A IS SUPERIOR, COLLEAGUE, SUBORDINATE

	B's Trust in A		p of Diff.
	Low	High	
A is superior			
M accuracy:	+.05 (34)	+.13 (40)	—
A is colleague			
M accuracy:	+.04 (13)	+.08 (32)	—
A is subordinate			
M accuracy:	−.37 (18)	+.12 (51)	.02

Note.—Data shown only for cases in which A and B have communicated about X. Includes all levels of agreement combined.

with no communication (significant at the .025 level). However, (*f*) when A and B *disagree* (by two or more response categories), then accuracy is no higher with communication than without. These findings suggest that simply communicating with another person about an issue may be sufficient to increase accuracy in perceiving existing agreement, but not sufficient to increase accuracy in perceiving existing disagreement.

Table 4 presents data on how A's accuracy is related to communication under varying conditions of B's trust in A. It may be seen in Table 4 that: (*g*) When B's trust in A is high, (i) A's accuracy is higher when he has communicated with B than when he has not (significant at .01 for all levels of agreement combined). Considering high and low levels of agreement separately, we find: (ii) accuracy in perceiving *agreement* is higher with communication than with no communication (significant at the .05 level). Accuracy in perceiving *disagreement* also is higher with communication than with no communication, but the difference is not statistically significant.

On the other hand, (*h*) when B's trust in A is low, (i) accuracy is not significantly related to communication, regardless of the level of actual agreement. (ii) Where A and B disagree, A's who have communicated with B are slightly *less* accurate in estimating the attitude of B than A's who have not communicated, although the difference, as noted, is not statistically significant. It is clear that communication is associated with high accuracy only when B trusts A. (Compare findings *gi* and *hi*.)

It is tempting to conclude, further, that lack of trust in another motivates an individual to distort his attitudes in communicating them to the other. However, another feature of Table 4 should be noted. (*i*) When A and B have communicated about X, A is not significantly more accurate in estimating the attitudes of B's who have high trust in him than of B's who have low trust.

This finding casts some doubt on the theoretical significance of trust, and raises further questions about the *conditions* under which lack of trust may lead to motivated distortions in the transmission of information about one's own attitudes. The following analysis may shed some light on this question.

Since the Personal Contact Checklist asked respondents to name persons above and below themselves, as well as colleagues, it is possible to separate the estimates made by superiors from those made by subordinates. It was expected that a subordinate would be more likely to conceal his attitudes from a distrusted superior than vice versa, since the superior is likely to have greater power over the subordinate, and the subordinate is more likely therefore to be motivated to conceal his attitudes from a superior he distrusts. Table 5 shows the results of this analysis. Results are shown only for all levels of agreement combined, and for pairs which have communicated

about X. In the absence of communication, no relationship is found between A's accuracy and B's trust in A.

According to Table 5: (*j*) A superior's accuracy in estimating the attitude of a subordinate (with whom he has communicated) is not related to whether or not he is trusted by the subordinate. This finding is clearly contrary to the above prediction. (*k*) Nor is a *colleague's* accuracy in estimating the attitude of another colleague related to whether or not he is trusted by the latter. However, (*l*) a *subordinate's* accuracy in estimating the attitude of a superior is definitely higher when he is trusted by the superior than when he is distrusted (significant at the .02 level).

These findings are especially interesting in that they run counter to what appeared to be a common-sense assumption. Is there something about the nature of the issue itself which makes the superior more cautious than the subordinate about expressing his attitude accurately?

On a strictly post-factum basis, the following speculations may be advanced. As noted earlier, the decision to set up the new research program had been made prior to the collection of data. What had not been decided in all cases, however, was the way in which the organization's resources (facilities, space, personnel, etc.) were to be allocated. Nor had the whole-hearted support of all the scientists themselves been elicited, as the data illustrate. The scientists most likely to be concerned about the distribution of resources, and about the success of the new program, were those with administrative responsibility for the various laboratories; that is, people at middle levels of supervision or higher. It may be that the caution of these superiors in communicating with distrusted subordinates was heightened by the uncertainties which characterize a period of initial and rapid change. Faced with uncertain responsibilities, and equipped with equally uncertain authority to cope with problems as yet unspecified, a supervisor may well suffer anxieties about his role. In these circumstances, his own attitudes may be highly tentative, and he may be especially hesitant about expressing them to any but his most trusted associates. The same logic should apply to his relations with other middle-level supervisors and with his own superiors. There were too few cases in these categories, however, to permit adequate analysis.

In view of the emphasis in previous studies on barriers to bottom-to-top communication, this line of thinking raises interesting possibilities about barriers to communication in the opposite direction. It suggests a situation in which high-level or high-status persons may conceal information from those below them, although this situation may be especially characteristic of research organizations and others with highly specialized personnel. The possibility seems worthy of further research.

SUMMARY

The hypothesis is advanced that a communicator, B, who lacks trust in the recipient of his communication, A, tends to be motivated to conceal his own attitudes about an issue, X, in communicating with A. The accuracy of A's perceptions is impaired accordingly. It is suggested, further, that concealment may be accomplished by communications which are evasive, compliant, or aggressive. Thus a distrusted A may be led to overestimate agreement in some cases and underestimate agreement in others. Data from a study in a large governmental research organization support these propositions.

In addition, two factors are noted which may influence the extent to which distrust imposes a barrier to accurate communication. These are: A's status relative to B's, and the nature of the issue.

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SCHIZOPHRENIA AND CENTRAL NERVOUS SYSTEM PATHOLOGY[1, 2]

GLEN A. BRACKBILL AND HAROLD J. FINE

Veterans Administration
Palo Alto, California

Veterans Administration
Bridgeport, Connecticut

ONE of the problems that the psychologist is frequently called upon to help solve is the differentiation between a schizophrenic reaction and the presence of central nervous system pathology. In many cases this is very difficult to do on the basis of test performance. The difficulty appears to stem from two sources. Many schizophrenics have the disconcerting tendency to respond to tests in the same way organics do. It is also apparent that quite a heterogeneous group of patients are called schizophrenic.

One attempt to clarify the diagnostic problem in schizophrenia, while not new, has recently become more prominent. Kantor, Wallner, and Winder (4), Phillips (6), Bellak (1), and Wittman (12, 13) among others, distinguish between a process or typical schizophrenia and a reactive or atypical kind. This differentiation implies a classification based on etiological (or at least historical) and prognostic factors. The term *process* suggests the idea behind this label. The disorder is thought of as a more or less gradual process developing over a period of years. Prodromal signs of the developing illness are present early in life, becoming more and more pronounced until outright psychosis is apparent in adolescence or young adulthood. Bleuler (2) has described such classical cases in an unsurpassed fashion. There is early evidence of the shut-in personality. Failure to interact with peers and excessive fantasy appear in childhood and seem to be forerunners of the illness. Once the psychosis has become acute, the patients tend progressively to deteriorate in spite of all attempts at treatment. Eventually, they become what is often called "burned out." Some of the bizarreness disappears and the patient becomes chronically ill with little likelihood of recovery.

The group here called reactive may show the characteristic symptoms of schizophrenia. Examination of the histories of such patients, however shows an absence of the prodromal signs mentioned in connection with the process group. In general, the history is one of adequate social development. There is usually some notable precipitating stress, and the prognosis for recovery is good. This is not to imply that there are no weaknesses in personality structure arising from developmental difficulties in such persons. The major points of difference between the two groups are in the prognosis and evidence of long-term progressive worsening of the adjustment pattern. This contrast is not simply a difference in the severity of symptoms. Both process and reactive patients may have delusions, hallucinations, and loss of contact with reality, and they may have catatonic, hebephrenic, simple, or paranoid symptoms.

These observations suggest that the process schizophrenics may suffer from some kind of organic impairment which is not present in the reactive cases. Such an organic factor would account for the similarities in test responses between these patients and those with known central nervous system pathology and for some of the difficulties in differential diagnosis. It also would help to explain many conflicting experimental reports, both psychological and physiological, in work with schizophrenia as based on a failure to distinguish between these broad categories of schizophrenia. This conception is consistent with the typical finding of great variability in the measures used in studies in this field (1, 10, 14). It is possible that more than one population is represented in the samples selected.

In order to try to clarify the problem, the following hypotheses were tested: (*a*) There are no significant differences in the incidence of "organic signs" on the Rorschach between a group of process schizophrenics and a group of known cases of central nervous sytem pathology. (*b*) Both organic and process groups show significantly more signs of organic involvement than does the reactive group.

[1] From the Veterans Administration Hospital, Palo Alto, California.

[2] Presented at the meeting of the Eastern Psychological Association, Philadelphia, Pa., April 16, 1955.

METHOD

Three groups were used in this study. The schizophrenic samples were made up of 36 patients diagnosed as process schizophrenia and 24 as reactive schizophrenia. The patients in these groups were all those admitted to a veterans hospital during the period of a year, diagnosed as schizophrenic, and given a Rorschach test. Cases involving multiple diagnosis, latent schizophrenics, and certain other cases were eliminated from the final sample. In the interest of brevity the reader is referred to the article by Kantor, Wallner, and Winder (4) for a more detailed description of the selection procedure. These authors classified the patients as reactive or process on the basis of case history information alone without knowledge of the Rorschach or regard for the severity of the clinical symptomatology. The case history evaluation was based on 24 items in the social service history broken down into areas of development. There were four groupings: birth to fifth year, fifth year to adolescence, adolescence to adulthood, and adulthood. They involved items in the social, sexual, and familial spheres as well as intrapsychic phenomena. Kantor, Wallner, and Winder were able to differentiate their sample reliably into reactive and process categories ($p < .01$). For this investigation, however, subjects (*Ss*) were included only where there was complete agreement between the judges as to the category of schizophrenia. A third group was composed of 28 cases of known organic involvement. Twenty-three of the 28 organics were paretics, two had Korsakoff's syndrome, two suffered from traumatic head injury, and one was a case of brain tumor.[3]

A recent study by Fisher, Gonda, and Little (3) shows that in a group of known organics, Piotrowski's signs (7, 8, 9) produce only 6 per cent false positives, i.e., a criterion of five organic signs results in only 6 per cent of individuals without organic pathology being assigned to the organic group. At the same time, this criterion gives about 62 per cent false negatives, i.e., 62 per cent of cases with known organic pathology show fewer than five of the signs. Thus, the Piotrowski technique[4] provides a conservative estimate of the presence of central nervous system pathology, but it seems to be the most efficient available.

The authors scored each of the Rorschach protocols in collaboration. The problem of interjudge reliability is not difficult because, with the exception of three signs, it is simply a counting procedure. Comparing the findings obtained here with those of Fisher and his collaborators shows that in the present group of known organics, 66 per cent were false negatives, which is not significantly different from their 62 per cent.

The data were treated by calculating the significance of the difference between proportions for the percentages and *CR* for the differences between means.

TABLE 1

INCIDENCE OF RORSCHACH SIGNS OF ORGANIC PATHOLOGY IN THE THREE DIAGNOSTIC GROUPS (MEANS AND PER CENT)

Group	*R*	*T*	*M*	*CN*	*F* + *f*%	*P*%	*RPT*	*IMP*	*PLX*	*AP*	Per Cent with 5 Signs	Mean No. of Signs
Process $N = 36$	61	33	78	17	22	22	39	19	33	17	36	3.42
Reactive $N = 24$	54	25	58	0	12	54	21	4	12	4	8	2.46
Organic $N = 28$	83	17	69	17	34	41	55	14	38	31	34	4.00

RESULTS

Against Piotrowski's criterion of five or more signs as a definite indication of organic involvement, no significant difference is found between the organic and process groups. The reactive schizophrenics, however, are significantly different from both organic and process subjects. The same result is obtained when one examines the mean number of signs in each sample with the exception that the difference between *P* (Process) and *R* (Reactive) only approaches significance (See Table 2). With the use of the one-tailed test, however, which is also appropriate, this difference is significant at less than the .05 level. When each sign is considered individually, only the total number of responses discriminates between *P* and *O* (Organic). Four of the ten signs distinguish at the .05 level between the *R* and *O* groups. A comparison between *P* and *R* indicates two signs, Color Naming and *P* per cent, that differentiate process from reactive schizophrenics. A third sign, Perplexity, just fails of significance.

The results tend to support the hypothesis that process schizophrenics react to a perceptual task in a similar manner to that of patients with central nervous system pathology. No specific hypotheses were made concerning individual signs. It is, nevertheless, interesting to examine some of the differences. Color Naming seems to show one of the clearest differences between the reactive and two other groups. Color Naming has long been considered one of the more significant signs of

[3] We would like to thank Clarence L. Winder and Paul McReynolds for making available records of the patients used in this study.

[4] The following ten signs as described by Piotrowski were used: total number of responses less than 15 (*R*), average time per response more than one minute (*T*), number of movement responses no more than one (*M*), at least one color denomination response (*Cn*), percentage of good form responses less than 70 (*F*%), percentage of popular responses less than 25 (*P*%), giving the same response to several blots (*RPT*), giving a response in spite of recognition of its inadequacy (*IMP*), distrust of own ability and request for reassurance (*PLX*), use of automatic phrases in an indiscriminate fashion (*AP*).

TABLE 2

SIGNIFICANCE OF DIFFERENCES BETWEEN DIAGNOSTIC CATEGORIES

Groups	*R*	*T*	*M*	*Cn*	*F+%*	*P%*	*RPT*	*IMP*	*PLX*	*AP*	Per cent with 5 Signs	Means
P and *O*												
CR	1.95	1.46	0.82	0	1.08	1.65	1.29	0.54	0.42	1.33	.34	1.17
p	.05	.14	.31	1.00	.28	.10	.19	.58	.67	.18	.73	.24
R and *O*												
CR	2.29	0.72	0.83	2.11*	1.85	0.95	2.52	1.24	2.14	2.51	2.15	3.25
p	.20	.46	.41	.03	.06	.34	.01	.21	.03	.01	.03	.001
P and *R*												
CR	0.54	0.66	1.66	2.16*	0.99	2.54	1.46	1.68	1.84	1.52	2.46	1.85
p	.58	.50	.10	.03	.32	.01	.14	.09	.06	.13	.01	.06

* Questionable because of the nonoccurrence of *Cn* in the *R* Group.

organic pathology. Perseveration and possibly perplexity seems also to distinguish between atypical schizophrenia and other pathological processes in that these signs appear less frequently in the reactive group. Perhaps the pathology involved in reactive schizophrenia, while more acute (*P* per cent), is less severe. One interpretation is that the reactive schizophrenic tends to overabstraction and fails to perceive the popular or readily apparent percepts. The process schizophrenic, like the organic, tends to be concrete and stimulus bound so that he perceives more of the popular responses, but is perplexed about these blots which do not offer an easily perceived form. Color Naming may be thought of as another example of concrete thinking processes, present in the *P* and *O* groups but entirely absent in *R*. There is reason to believe that one of the critical differences between the *P* and *R* groups is in terms of a kind of thinking disturbance.

It seems quite apparent from this study that some patients diagnosed as schizophrenic cannot be distinguished from patients with known organic involvement on the basis of Piotrowski's set of organic signs in the Rorschach. Such signs, however, do show significant differences between two kinds of schizophrenia. Lack of validity in measurement seems an inadequate explanation of these findings since many studies show positive indications of central nervous system pathology in some schizophrenics (1, 5, 11). The identification of cortical cell disease by Winkleman and Book (11), Papez and Bateman (5), and many others appear to have been in patients who might be classified as process schizophrenics. It is reasonable to infer that such findings may represent an important dimension in schizophrenia which has been ignored in experimental studies.

Perhaps the difficulty in differential diagnosis of organic involvement and schizophrenia is not due to lack of sensitivity in the test variables, but to the grossness of the category "schizophrenia." An added implication may be that progress in the understanding of schizophrenics might be enhanced if the conflicting results of physiological and psychological studies could be reduced by more systematic use of the case history criteria suggested.

SUMMARY

This study attempted to investigate some of the dismensions of schizophrenia. Three groups of subjects were studied: a group diagnosed as typical process schizophrenia, an atypical or reactive group of schizophrenics, and one with known central nervous system pathology. Rorschach protocols were examined for the incidence of Piotrowski's ten signs of organic involvement. It was found that the organic and process groups could not be distinguished from each other, but both of these groups showed significantly more subjects with at least five signs than did the reactive group. It was suggested that the difficulty in differential diagnosis of some kinds of schizophrenics and organics results from the involvement of central nervous system pathology in process schizophrenia. It is suggested that research findings would be less equivocal in studies of schizophrenics if this possibility were considered in the selection of subjects for investigations of schizophrenia.

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ATTITUDES AS ADJUSTMENTS TO STIMULUS, BACKGROUND, AND RESIDUAL FACTORS[1]

HARRY HELSON, ROBERT R. BLAKE, JANE S. MOUTON, AND JOSEPH A. OLMSTEAD

The University of Texas

One of the most important problems in any systematic approach to behavior concerns the role of attitudes —how they are formed and their expression on specific occasions. There have been two main types of emphases in the study of attitudes, one stressing situational factors and the other stressing factors within the individual. The first approach has stressed the influence of group values, standards, or reference norms in molding individual behavior but without making provision for the operation of personal factors which may facilitate or militate against conformity to social pressures. In contrast, personality-oriented approaches have tended to stress individual traits, motives, or patterns of response usually discovered by paper and pencil tests or through the use of materials such as pictures or inkblots. Neither the situational nor the personality-oriented approaches provide a theoretical framework by which both sets of factors may be investigated and evaluated.

A third approach to the problem of the organization of the individual as it relates to his interpersonal relations in specific situations is found in the theory of adaptation-level (AL) which provides a framework for both situational and personal factors simultaneously. AL theory has proved fruitful in unifying many previously unrelated phenomena in psychophysics (7, 8, 10, 12, 13, 14), judgment (15), and perception (9), and it has also been instrumental in designing and interpreting experiments in social psychology dealing with such actions as signing petitions (3), making contributions (5), violating prohibitions (6, 11), and volunteering (4, 17). In the investigation reported here it is shown that attitudes expressed in "alone" situations, uninfluenced by social pressures, may be altered in systematic fashion when group influences are brought to bear on the individual.

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According to AL theory adjustive behavior is determined by three sources of variance which have been identified in perception and judgment and have been found, *mutatis mutandis*, to be important in the expression of personality patterns: (*a*) stimuli immediately confronting the individual, (*b*) background stimuli, and (*c*) residual effects of stimuli from past experience. Although the distinction between stimuli as such and background stimuli is not always easy to draw, when an individual is instructed to respond to specific stimulation during or soon after other stimuli have acted, the latter may be regarded as background stimuli with respect to the focal stimuli. Beliefs, attitudes, traits, and cultural determinants which individuals bring to any concrete situation may be regarded as residuals in affecting specific responses. Individual differences in behavior are thus envisaged as arising from differential effects of stimuli, background, and residual factors, or from the particular way in which these interact in specific situations to produce any given response. Behavior is thus envisaged as the resultant of the interactions among these three sets of factors, and any particular response depends upon the adjustmental level for that situation. Behavioral level is not necessarily fixed but rather shifts in accordance with changes in the various factors operating within the situation and the individual. The concrete implications of this position will be seen in the specific hypotheses and design for the experiment reported here.

Experimental Design and Hypotheses

Description of variables. The present study was conducted under both alone and simulated group conditions (2, 16) to investigate the influence of opinions of other people (background) and some already established characteristics in the individual (residuals) on the expressed attitudes toward statements (stimuli) dealing with war and peace. Measures of each of the three sets of factors in determining the individual's response were available as follows: the stimuli were propositions regarding war and peace scaled by Thurstone and Chave on a large sample of individuals;

Order of Presentation	Statement	Thurstone-Chave Scale Values	Background Report
1.	The misery and suffering of war are not worth its benefits.	7.8	strongly agree
2.	We should have some military training in our schools.	4.4	strongly agree
3.	Because right may be more important than peace, war may be the lesser of two evils.	4.2	neutral
4.	It is hard to decide whether wars do more harm than good.	5.5	strongly agree
5.	Compulsory military training in all countries should be reduced but not eliminated.	5.4	strongly disagree
6.	An organization of all nations is imperative to establish peace.	7.0	neutral
7.	Nations should agree not to intervene with military force in purely commercial or financial disputes.	6.3	strongly disagree
8.	Those military units should be retained which afford training to body and mind.	4.8	neutral
9.	It is our duty to serve in a defensive war.	4.1	strongly disagree
10.	Only in a war in which moral issues are clearly at stake is the individual under obligation to serve.	5.8	strongly agree
11.	Wars are justifiable only when waged in defense of weaker nations.	5.2	strongly disagree
12.	If war is necessary to maintain national interests, every individual opinion must yield.	3.6	strongly agree
13.	The most that we can hope to accomplish is the partial elimination of war.	5.6	neutral
14.	It is almost impossible to have a large military without being tempted to use it.	7.0	neutral
15.	Another war would be terrible but it might be worth the price.	4.0	strongly disagree
16.	All civil and national differences can be settled without war.	7.6	strongly disagree
17.	It is good judgment to sacrifice rights in order to prevent war.	7.8	strongly agree
18.	War brings out the bad qualities in men as well as some good ones.	5.6	neutral

FIG. 1. SENTENCES EMPLOYED WITH THURSTONE-CHAVE SCALE VALUES AND ORDER OF PRESENTATION

background opinion was deliberately determined so as to be very favorable, unfavorable, or neutral with regard to the statements; and residuals (ascendance-submission) were measured by means of the A-S Reaction Study. Undoubtedly many other background and residual factors play a role in determining individual responses but the ones chosen for investigation here certainly are important. The influence of background opinion was determined by comparing reactions to stimuli made after hearing the opinions of the (simulated) group with opinions given alone. Influence of residuals was determined by comparing responses with respect to ascendance-submission ratings.

Stimulus statements. Sentences from the Thurstone Militarism scale were selected so as to provide a continuum from pro- to antimilitaristic statements. The Thurstone-Chave scale includes items with values ranging from 0, indicating extreme militarism, through 5.5 for neutral statements, to 11 for extreme pacifism (19). Promiltaristic sentences selected for use included three strongly militaristic and three moderately militaristic statements with Thurstone-Chave scale values from 3.6 to 4.8. The six neutral statements were selected from the intermediate range of the scale with three from the slightly promilitaristic (5.2) and three from the slightly antimilitaristic (5.8) sides. The antimilitaristic statements included three moderately pacifistic and three strongly pacifistic sentences, with scale values of 6.3 to 7.8. By selecting statements in this way, an equal number of items ranging from neutral and differing from neutral in varying degrees in both the militaristic and antimilitaristic directions were represented in the study. Figure 1 gives the statements employed, their Thurstone-Chave scale values, and order of their presentation.

Subjects judged the statements on a seven-category scale. For purposes of computation, judgment categories were assigned the following numerical values: strongly disagree, 1; disagree, 2; mildly disagree, 3; neutral, 4; mildly agree, 5; agree, 6; strongly agree, 7. Each *S* judged the 18 sentences shown in Fig. 2 both "alone" and with the background condition shown in Fig. 2.

Social background. Under simulated group conditions (2), the test *S* heard through his earphones attitudes expressed toward each sentence by four other *S*s before giving his judgment. Judgments by background *S*s and instructions were tape recorded. Intervals of appro-

Background Reports	Residual Subject Type	Type of Sentence		
		Promilitaristic	Neutral	Antimilitaristic
Strongly agree	Ascendant Average Submissive	2, 12	4, 10	1, 17
Neutral	Ascendant Average Submissive	3, 8	13, 18	6, 14
Strongly disagree	Ascendant Average Submissive	9, 15	5, 11	7, 16

FIG. 2. ORDER IN WHICH PROPOSITIONS WERE GIVEN *Ss*. NUMBERS IN CELLS REFER TO SENTENCE ORDER IN FIGURE 1 AND TO THE POSITION OF SENTENCES IN THE EXPERIMENTAL SEQUENCE

priate length were placed in the tape for the test *S* to answer in his turn. The recorded voices expressed either agreeing, disagreeing, or neutral attitudes toward equivalent statements in the hearing of test *Ss*. The background thus was structured so that it was possible to determine the extent to which expressed attitudes were influenced by social context.

As shown in Figs. 1 and 2, three degrees of agreement were reported by the background *Ss* during the 18 trials. For six statements the agreeing background consisted of reports by three of the simulated *Ss* expressing strong agreement and one expressing moderate agreement. Neutral backgrounds were created for six additional stimulus sentences by having two *Ss* give neutral responses, a third reporting mild agreement and the fourth mild disagreement with the statements. Disagreeing backgrounds for the remaining six sentences were created by three *Ss* reporting strong disagreement and the fourth mild disagreement.

In the three blocks of six sentences each, two were classified as promilitaristic, two as neutral, and two as antimilitaristic on the basis of the Thurstone-Chave scaling. As a result, two of the six promilitaristic statements were presented to the test *S* in a social context strongly agreeing with the statement, two were given a neutral background, and the remaining two promilitaristic statements were given a strongly disagreeing background. A similar pattern of background was employed for the neutral and the antimilitaristic sentences.

Residual measure. The A-S Reaction Study was used to measure personal characteristics, i.e., one set of residuals, considered to be important in the present experiment. Forty-five male college students were divided into three groups according to their scores on this measure. The *Ss* with A-S decile scores ranging from 1 to 4 were classed as ascendant, those with scores of 5 and 6 were classed as average, and *Ss* with A-S decile scores ranging from 6 to 10 were classed as submissive subjects.

The hypotheses of immediate concern in this study are as follows:

1. In general, since the expression of an attitude depends upon the interaction of personal (residual) factors with both the specific stimuli calling forth a response and the contextual stimuli accompanying or immediately preceding the focal stimuli, variation in background and/or residual stimuli will modify the response made to otherwise identical stimuli. Specifically it is hypothesized that:

2. A proposition accompanied by strong expressions of agreement (or disagreement) on the part of other individuals will tend to shift an individual's response toward greater agreement (or disagreement) as compared with the response made to the proposition in the alone situation; and

3. Submissive individuals will be more affected by the expressed opinions of other members of a group than will ascendant individuals while average individuals are expected to be influenced by group opinion less than the submissive individuals and more than the ascendant individuals. Where anticonformity residuals are very strong, responses in the group situation may even be inconsistent with responses made in the alone situation.

4. When the background opinion is neutral, it is hypothesized that there should be no difference between ascendant, average, and submissive individuals in the attitudes expressed in the group situation as compared with those expressed in the alone condition. In other words, there should be no significant change from alone opinion when background opinions are neutral with respect to the stimuli.

RESULTS

Interaction Among Stimulus, Background, and Residual Factors

Stimulus, background, and residual factors, varied in three degrees as described above, resulted in the $3 \times 3 \times 3$ factorial design shown in Fig. 2.

Since the responses were expressed on a seven-category scale, data are summarized by computing mean values for each of the cells in the factorial design. The numbers in parentheses in Table 1 represent the differences between the means of the background reports and the means of the subject reports grouped according to A-S scores. Mean values for each condition are shown in Table 1. Table 2 contains a summary of the analysis of variance for the data in Table 1.

The results summarized in Table 1 and the analysis of variance given in Table 2 fully support the four hypotheses underlying the present study. Individuals classed as submissive deviate less than do average and ascendant individuals from group opinion and average individuals fall between ascendant and submissive individuals. In the four cases where background opinion is either in strong agreement or disagreement with the stimuli, i.e., excluding the cases where background opinion

TABLE 1

MEAN VALUES OF EXPRESSED ATTITUDES FOR COMBINATIONS OF SENTENCE TYPES, BACKGROUND CONDITIONS AND SUBJECT CHARACTERIZATIONS*
(Values in Parentheses are Differences between the Average Background Judgment and Average *S*)

Group Background Report	Residual Subject Type (A-S)	Sentence Type			
		Pro-militaristic	Neutral	Anti-militaristic	Total sentence
Agree (7, 7, 6, 7)	Asc.	5.67 (1.08)	4.73 (2.02)	4.13 (2.62)	4.84 (1.91)
	Ave.	5.97 (0.78)	5.33 (1.42)	5.30 (1.45)	5.53 (1.22)
	Sub.	6.00 (0.75)	5.77 (0.98)	5.37 (1.38)	5.71 (1.04)
	Mean	5.88 (0.87)	5.28 (1.47)	4.93 (1.82)	5.36 (1.39)
Neutral (5, 4, 4, 3)	Asc.	4.07 (0.07)	4.57 (0.57)	4.50 (0.50)	4.38 (0.38)
	Ave.	3.33 (0.67)	4.53 (0.53)	4.97 (0.97)	4.28 (0.28)
	Sub.	3.40 (0.60)	4.60 (0.60)	5.00 (1.00)	4.33 (0.33)
	Mean	3.60 (0.40)	4.57 (0.57)	4.82 (0.82)	4.33 (0.33)
Disagree (1, 1, 2, 1)	Asc.	4.67 (3.42)	2.33 (1.08)	3.33 (2.08)	3.44 (2.19)
	Ave.	3.40 (2.15)	1.87 (0.62)	2.37 (1.12)	2.54 (1.29)
	Sub.	3.13 (1.88)	2.00 (0.75)	2.27 (1.02)	2.47 (1.22)
	Mean	3.73 (2.48)	2.07 (0.82)	2.66 (1.41)	2.82 (1.57)
Mean of means	Asc.	4.80 (1.52)	3.88 (1.22)	3.99 (1.73)	4.22 (1.49)
	Ave.	4.23 (1.20)	3.91 (0.86)	4.21 (1.18)	4.12 (0.93)
	Sub.	4.18 (1.68)	4.12 (0.78)	4.21 (1.13)	4.17 (0.86)
	Mean	4.40 (1.25)	3.97 (0.95)	4.14 (1.35)	4.17 (1.10)

* The differences between any two means necessary for significance at or beyond the .05 and .01 levels of confidence are:

	.01	.05
Row means	1.131	.859
Sub means	.652	.495
Grand means	.375	.285

TABLE 2

ANALYSIS OF VARIANCE OF STIMULUS, BACKGROUND, AND RESIDUAL MEASURES

Source of Variance	Sum of Squares	*df*	Mean Square	*F*
A-S Groups	.73	2	.37	.36
Subj. in same group	43.06	42	1.03	
Total between subjects	43.79	44		
Stimulus sentence	12.91	2	6.46	4.52*
Background report	442.15	2	221.08	154.60**
A-S × Stimulus	13.00	4	3.25	2.29
A-S × Background	44.94	4	11.26	7.87**
Stimulus × Background	109.35	4	27.34	19.12**
A-S × Stimulus × Background	4.45	8	.56	
Pooled subjects × Conditions	480.16	336	1.43	
Total within subjects	1106.96	360		
Total	1150.75	404		

* $p < .05$.
** $p < .01$.

is neutral, there is clear, marked decrease in deviation from background opinion as one considers ascendant, average, and submissive group results. With neutral background the deviations from group opinion are practically random among the three classes of individuals.

Stimulus statements. Without considering variance from social background or A-S categories the *F* of 4.52 for variance in expressed attitudes associated with stimulus sentences is significant at the 5 per cent level. The bottom row of Table 1 shows that *S*s agreed more with the promilitaristic statements than with the antimilitaristic or neutral sentences. The difference between promilitaristic and neutral sentences is the only one significant at the 1 per cent level. Since the difference between neutral and antimilitaristic statements fails to attain significance, it can be inferred that sentence content did not strongly influence the responses, and therefore the differences between alone and simulated group conditions and between the various classes of *S*s cannot be attributed to the content of the sentences. The main effects must therefore be sought in the background and residual factors operative in this study.

Background conditions. Variance associated with differences among backgrounds is given in Table 2. Without considering variance due to sentence content or that due to A-S type, the obtained *F* of 154.60 for differences among background conditions is significant far beyond the 1 per cent level. Hence individual responses are significantly affected by both positive and negative social backgrounds and when *S*s have measured differences in ascendance-submission tendencies.

The differences in responses between agreeing and neutral on the one hand and between the neutral and disagreeing backgrounds on the other hand are highly significant, both being beyond the 1 per cent level. The *S*s disagree more with statements when the background *S*s disagree with them and they agree more with statements when background *S*s agree with them. The decisive influence of the background in modifying the expression of attitudes is thus clearly demonstrated in this experiment.

A-S groups. The analysis of variance for A-S groups in Table 2 gives an *F* of .36 which is not significant. That the three A-S groups do

not differ from one another with respect to the material used in this experiment is shown by the mean expressions of attitude by the three A-S groups: ascendant, 4.22; average, 4.12; and submissive, 4.17. These results indicate that degree of ascendancy is unrelated to militarism-pacificism. However, ascendant *S*s maintain their alone attitude in the face of group pressure significantly more than do submissive *S*s as later discussion will show.

Stimulus-background interaction. Tables 1 and 2 show that significantly higher mean values of expressed attitudes are found for agreeing than for disagreeing background and this occurs with all types of statements. The mean value for attitudes expressed with neutral background is intermediate to the mean values with the agreeing and disagreeing backgrounds for two of the three types of statements.

Stimulus statements and background factors interact significantly as shown by the *F* of 19.12 in Table 2. Mean values for sentence type as a function of background are given in Table 1.

Inspection of the mean means in Table 1 also shows that more agreement is expressed with promilitaristic sentences than with antimilitaristic ones. The mean difference between promilitaristic sentences and antimilitaristic sentences, both with agreeing backgrounds, is significant beyond the 1 per cent level. With disagreeing backgrounds the mean difference between the promilitaristic sentences and the antimilitaristic sentences is significant beyond the 1 per cent level. These findings indicate that with either the agreeing or the disagreeing background condition, more agreement is expressed for promilitaristic than for antimilitaristic sentences. The higher averages for the promilitaristic statements under two of the three conditions of background suggest a small promilitaristic orientation for this group of *S*s. With neutral background, the difference between antimilitaristic statements and promilitaristic statements in the opposite direction from the differences reported above is not statistically significant.

The analysis of background effects shows that not only is background significant in determining expressed attitudes but, even more important, background effects are not uniform. They depend upon interaction with stimulus material and residuals because agreeing backgrounds produce greater shift in the agreeing direction with militaristic statements than with antimilitaristic statements. The extent to which group influences operate will therefore be determined in part by the task facing the individual and in part by personal factors relevant to the situation.

A-S background interaction. While backgrounds influence individual opinions it must not be assumed that they act equally on all individuals because there is significant interaction between background and A-S types. The differences between the ascendant and the submissive *S*s are greatest when there is maximum disparity between statements and background opinions. The mean differences between antimilitaristic sentences judged on an agreeing background and for promilitaristic sentences on disagreeing background are significant beyond the 1 per cent level. These mean values can be contrasted with comparable ones for the conditions where sentence content and background are in agreement. The first is not significant while the second attains significance at the 5 per cent level. None of the differences between the three groups of *S*s is significant for neutral background conditions of judging.

The interactions between background and A-S types suggest an important relationship between ascendance and submission and the effect of social background. Where there is contradiction between background reports and the sentiments expressed by the statements, submissive *S*s are more likely to shift their judgments so as to express attitudes consistent with background attitudes to a greater extent than do ascendant *S*s. These results are consistent with Allport's contention concerning the relationship between A-S scores and behavior in coercive situations (18). Ascendant *S*s certainly are influenced less by social context than are submissive *S*s in this study.

Distribution of Individual Scores

The results so far indicate that the simulated group technique can significantly change individual judgments and that submissive *S*s are more responsive to background opinion than are ascendant *S*s for extreme background.

One way of assessing the extent to which individuals shift their responses as a function of the experimental arrangements involves comparing their responses in the group situa-

tion with those given under "alone" conditions. The extent to which responses in the group conditions shift away from alone responses in the direction of the background report may serve to differentiate individual from individual. Such an analysis is possible since all *S*s responded to identical statements under alone conditions after the group phase of the experiment. The difference between alone judgments and judgments made under simulated group conditions constitutes the measure of the influence of background judgments. The analysis will be based on the 12 sentences that were judged with the agreeing and disagreeing backgrounds.

Method of scoring shifts in expressed attitudes. Changes in attitude were assessed in two ways: (*a*) by the number of times *S*s changed in the group situation from the opinion expressed in the alone situation and (*b*) by the amount of change from the alone situation to the group situation by taking the difference between the category number assigned to the judgment in the alone situation and the category number of the opinion in the group situation. Thus, if a subject expressed mild disagreement, 3, with a statement in the alone situation and mild agreement, 5, with the statement in the group situation, the difference would yield a movement score of 2. Total movement for a subject is the sum of the movement scores on each item.

If *S* changed his response in the simulated condition from his alone report in the direction of the background report, the shift was scored plus on the assumption that he had been influenced in a positive direction by the background. If the change was away from the direction of the background report, the shift was scored minus, on the assumption that he had been negatively influenced by background. If his response in the group and in the alone situation was constant and was the same as the background report, the response was scored plus, on the assumption that he had not shifted from the group report. If the constant response was different from the background report, it was scored minus since it could be presumed that he had resisted change in the group direction.

Frequency and amount of shift from alone attitude toward the background report. Differences in susceptibility to background factors appear in the number of changes in opinion of an individual toward or away from background report. Such susceptibility also appears in the total amount of change as a function of background. Since responses could be assigned numbers on a continuum, total change could be calculated as the sum of changes in judgment categories toward or away from the group opinion.

TABLE 3

CHANGES IN ATTITUDE TOWARD BACKGROUND JUDGMENT

Frequency of Changes in Attitude	Total Amount of Change per Subject	Number of Subjects
2	4.5	2
3	6.0	2
4	6.0	4
5	10.0	6
6	14.4	13
7	16.0	7
8	16.1	7
9	32.0	2
10	—	—
11	32.0	2

Measures of changes in attitudes reveal that some individuals modify their responses by a considerable amount, some change only by a small amount, and some change a moderate amount when in the group situation. Data in Table 3 show the frequency and amount of change in attitude from the alone to the group condition.

Table 3 indicates that the entire group of 45 *S*s changed from the attitude expressed in the alone situation toward the background report on at least two of twelve possible occasions. The range is great, extending from a minimum of 2 to a maximum of 11. The *S*s who were influenced to change toward the group in 11 of the 12 occasions represent the most changeable persons among the 45 *S*s. Thirteen *S*s, the modal number, changed in the group direction in 50 per cent of the possible occasions. The average change per *S* for the modal *S*s is 14.4 category steps. The range in total movement toward the background, as measured in number of category steps, also is large, extending from 4 to 37. The value of 4.5 in Table 3 is the average for two *S*s who changed the least amount. The spread in both number of changes and in amount of change shows that the experimental conditions employed here effectively discriminated among

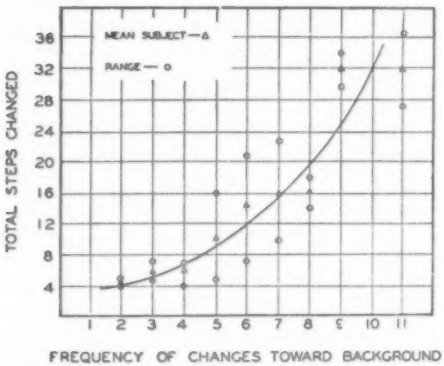

FIG. 3. TOTAL MOVEMENT TOWARD BACKGROUND JUDGMENT AS A FUNCTION OF THE NUMBER OF TIMES SUBJECTS CHANGED OPINIONS

TABLE 4

CHANGES IN ATTITUDE AWAY FROM THE BACKGROUND JUDGMENT

Frequency of Changes in Attitude	Total Change per Subject	Number of Subjects
0	0.0	19
1	1.4	13
2	4.0	8
3	5.2	5

Ss in terms of the degree to which they modified their attitudes in response to group factors. Wide individual differences in extent of movement toward the background report are evident.

The data in Fig. 3 show that *the more frequently a subject changes from his alone attitude toward the background report the larger do his shifts in attitude tend to be.* Thus, the total amount of change by the two *Ss* who shifted attitude on only 2 of the 12 occasions averages only 4.5 category steps whereas the two *Ss* who shifted 11 times shifted a total of 27 and 37 category steps respectively. The more often an *S* is influenced by social background the greater does the influence tend to be according to the data presented in Table 3 and Fig. 3. The *Ss* at both extremes are of particular interest from the standpoint of selection and screening.

Frequency and amount of shift from alone attitude away from the background report. By comparison with attitudes expressed under

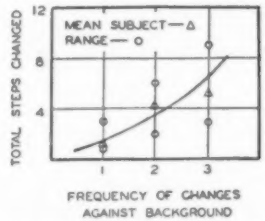

FIG. 4. TOTAL MOVEMENT AWAY FROM BACKGROUND JUDGMENT AS A FUNCTION OF THE NUMBER OF TIMES SUBJECTS CHANGED OPINIONS

alone conditions some *Ss* shifted their responses in a direction away from that represented by background judgments. The number of such changes and the total amount of shift are presented in Table 4. This table shows that 19 of the 45 *Ss* *never* moved in a direction opposite to the background report. Thirteen *Ss*, however, moved away from the background report on one of the 12 propositions, 8 *Ss* moved in the opposite direction from the background on 2 of the propositions, and 5 on 3 or more of the propositions. By contrast with the data presented in Table 3 which demonstrate the widespread influence of background reports on shifting attitudes in the group direction, these data show that attitudes contrary to the background judgments are much less common. The comparison provides an illustration under experimental conditions of the extent to which the expression of attitudes may be negatively influenced by knowledge of attitudes that exist in the immediate context of action.

Just as the data in Fig. 3 show that the more frequently *Ss* change toward background judgments the larger is the total amount of change so the data in Fig. 4 show that the more frequently *Ss* change in a direction away from the background reports the larger are the changes. Hence, whether *Ss* move toward or away from social background, amount of movement is highly correlated with the frequency of movement.

Cutting across the tendency to shift in the direction of background judgment against one's own position is a mode of behavior characterized by disagreeing with the background when it coincides with attitudes expressed under alone conditions. This highly paradoxical type of behavior may arise either from sheer inconsistency or carelessness in

TABLE 5

AVERAGE CHANGE TOWARD OR AWAY FROM THE BACKGROUND JUDGMENT AS A FUNCTION OF ASCENDANCE-SUBMISSION SCORES
(For each category, $N=15$)

Subject Type	Toward Group	Away from Group
Ascendant	10.5	2.2
Average	15.5	1.3
Submissive	17.1	1.7

judging the propositions, or, perhaps more likely, from a sort of contrariness which results in disagreement with self in order to be in disagreement with the background. While the average of this type of change amounts to only 1.40 category steps, it is sufficiently frequent to merit further investigation.

Frequency of shift from alone attitude toward or away from the background by A-S classification. The experimental design permits analysis of shifts in attitude as a function of A-S category as previously discussed. The data in Table 5 present this relationship in another way by showing that the average *S* rated as submissive on the A-S Reaction Study changed a total of 17.1 category steps toward the background, while the average *S* rated as ascendant changed only 10.5 category steps toward the background report. Average *S*s were intermediate between these two values with a mean of 15.5. The mean difference between the amount of shift for the ascendant and of that for the submissive category is significant beyond the 1 per cent level.

Consistent with these findings is the fact that movement away from the background is greater among the ascendant *S*s than among the average and submissive *S*s, as shown in Table 5. Although the differences between the ascendant group on the one hand and the average and submissive groups on the other are small and are not significant, they are in the expected direction.

SUMMARY

Stimulus, background, and residual factors in interaction have been shown to modify the expression of attitudes. Statements concerning war and peace were judged under simulated group conditions and in an alone condition. Residual factors thought to be important were studied by selecting subjects who represented different degrees of ascendancy-submissiveness as revealed by the Allport A-S Reaction Study. The factors were covaried in such a way that interactions among them could be investigated.

When individuals are exposed to the opinions of others with regard to statements concerning war and peace, it is found that their own expressed attitudes shift more or less markedly toward group opinion. It is also found that the more frequently individuals respond to background influences, the larger is their shift toward or away from the group. Both the frequency and amount of shift from alone opinion toward background judgments correlate with degree of submissiveness as measured by the Allport A-S Reaction Study.

The fundamental assumptions underlying the present study have been verified: the expression of attitudes depends upon both situational and personal factors which must be evaluated simultaneously in order to predict individual behavior. Group influences, while effective in modifying individual behavior, do not have uniform results, as shown by the significant interactions found among stimulus, background, and residual factors. Consistent with adaptation-level theory the expression of attitudes is an adjustment of the individual representing the pooled effect of these three sources of variance.

The experimental situation employed in this study results in a wide scattering of subjects with respect to the amount of yielding to background influences, thus providing a satisfactory procedure for revealing individual differences. Because range in frequency and total amount of yielding to background judgments is large and indicates a fairly normal distribution with respect to the type of behavior under study, it would appear that individual scores useful for measuring social adjustment or for psychiatric screening may be obtained by employing this method as a testing procedure and correlating the results with other relevant measures of behavior.

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VERBAL SATIATION AND PERSONALITY[1]

DONALD E. P. SMITH AND ALTON L. RAYGOR
University of Michigan

SATIATION may be described as the reduction in effectiveness of a stimulus with continued exposure. The concept has been invoked to account for a number of diverse phenomena, loss of word meaning with repetition (1), visual alternation during fixation of ambiguous figures (9), boredom (6), alternation behavior of rats in a T maze (3, 15), and diagnosis of brain lesion (8). Furthermore, McDougall (11, pp. 441–449) suggested a relationship between rate of visual alternation (a possible index of satiation rate) and the introversion-extraversion dimension of personality. While this relationship was denied by Guilford (4), a recent unpublished study by the writers confirms a modified version of McDougall's hypothesis.

Walker (15) has suggested a neurological basis for the satiation process involving a progressive reduction in response probability resulting from continued or repeated firing of a "reaction system" with continued exposure to the stimulus. In Hebb's terms (5), it would result from continued elicitation of the relevant "phase sequence." The personality correlates of satiation have yet to be specified, but, as will be demonstrated, at least one personality variable appears to be related to differential *rate of recovery* from the refractory condition implied by Walker's position.

The present studies have been designed to determine verbal and personality correlates of satiation. Specifically, two questions are posed: (*a*) is associative activity in thinking a function of satiation? and (*b*) does the process of satiation operate differentially in accord with personality structure?

STUDY 1

A word-association technique was used to determine the effect of visual satiation on thinking. The hypothesis tested is as follows: prolonged visual exposure of a stimulus word results in a word-association response by *S* which is less common than that elicited under brief exposure.

Subjects and Procedure

Twenty-four college students, 17 male and 7 female, in two groups of 13 and 11, were seated before a projection screen on which were exposed words selected from the Kent-Rosanoff Word Association Test (7). Each group was subjected to two experimental conditions, satiation and control. The satiation condition consisted of three exposure periods of 7 seconds at 3-second intervals. The *S*s were instructed to fixate the word during the exposure interval and to write it as they pronounced it subvocally during each 3-second rest interval. A final 3-second delay was followed by an exposure of the same stimulus word for 40 ms. and *S*s responded anonymously in writing as to a word-association test item, "even if your response seems silly or unrelated or even obscene or embarrassing." The control condition consisted of the simple visual word-association test procedure only, a 40 ms. exposure of each word with directions to respond in writing with the first word aroused other than the one shown. The directions for responding were identical for both conditions. One practice item was used to demonstrate the procedure.

Stimulus words with very common responses, as indicated by the Kent-Rosanoff frequency table (7), were chosen: *father* (practice); Series A—*dark, sweet, hard, cottage, bitter, green*; Series B—*man, black, window, boy, ocean, heavy*.

Group I *S*s received the practice word and Series A under the satiation condition followed by Series B under the control condition. Group II *S*s received the practice word and Series B, satiated, followed by Series A, control, thereby controlling for possible differences in response frequency of the stimulus words unrelated to the presentation condition.

Results

Responses were classified as common or uncommon on the basis of the Kent-Rosanoff frequency table. A response was designated *common* if it occurred 35 or more times among the responses of 1,000 normal subjects; a response occurring less than 35 times was designated *uncommon*. (Treatment of the data showed 35 to be a fortunate choice as a cutting point since the number of common and uncommon responses was approximately equal under the control condition.)

The *S*s were categorized as giving more common than uncommon responses or more uncommon than common responses under each condition. The number of *S*s giving more uncommon than common responses under the satiation condition was significantly greater than that under the control condition (Table 1). Tabulation by frequency of response rather than by individuals yielded a χ^2 of 10.38, $p < .01$. A test with a new sample of 16 *S*s with a 20 sec. continuous expo-

[1] The writers wish to thank E. L. Walker for suggestions concerning the design and W. Clark Trow for critical reading of the manuscript.

TABLE 1
RELATIVE FREQUENCY OF COMMON AND UNCOMMON WORD-ASSOCIATION RESPONSES

Condition	Frequency		
	C > UC	C < UC	Total
Control	14	10	24
Satiation	7	17	24

$\chi^2 = 8.40$; $p < .01$.

sure (rather than with three 7 sec. exposures), but with other procedures duplicated, yielded a more convincing difference confirming the hypothesis ($\chi^2 = 26.8$, $p < .001$).

Discussion

The present evidence is congruent with a response probability theory of satiation. It appears that, in some *S*s, continued fixation arouses responses more distantly related to stimulus words than does brief fixation.

STUDY 2

To determine whether the satiation process operates differentially in accord with personality structure, the previous procedure was repeated with a group of students who had responded to a personality inventory. The instrument, reported elsewhere (12, 13, 14), purports to measure two nearly orthogonal dimensions, the first tentatively labeled "permeability" (10) and the second, anxiety. Individuals scoring at the permeable extreme tend to be sensitive to stimuli, socially oriented, flexible, and imaginative. The impermeable tend to be relatively insensitive, rigid, conservative, and methodical. A comparison of these measures with Eysenck's introversion-extraversion dimensions (2) indicates that permeables with little anxiety are similar to his extravert and that impermeables with considerable anxiety are similar to his introvert.[2]

While the writers felt that the individuals at the extremes of personality structure would differ in satiation effect, it was difficult to predict which would exhibit uncommon responses after satiation. Since the imaginative activity and volatility of permeables would lead one to predict rapid "breakdown" of a visual (and conceptual) image, they should demonstrate the satiation effect. However, they may also recover from satiation rapidly, thus masking the effect.

It was predicted, then, that *S*s categorized as permeable and impermeable would differ also in demonstration of satiation effect, inferred from the relative uncommonness of responses to word-association items under prolonged exposure. The direction of the difference was not predicted.

Subjects and Procedure

A class of 36 undergraduates in educational psychology was divided into two groups, A and B, with approximately equal distributions of permeability scores. Two lists of 10 words with common responses, list X and Y, were drawn from the Kent-Rosanoff list. Group A was exposed to list X under the satiation condition (prolonged exposure) and to list Y under brief exposure. Group B was exposed to list Y under the satiation condition and to list X under brief exposure.

The satiation procedure consisted of a 20-second exposure period during which *S* fixated the stimulus word and repeated it subvocally, one second pause, and a ½-second exposure after which *S* wrote his response on a numbered sheet. Control procedure consisted of a ½-second exposure, a 20-second pause, and a ½second exposure after which *S* responded in writing.[3] The responses of group A and B were combined, and those of *S*s scoring at the mean of permeability scores were discarded. The remaining *N* of 30 was divided into two groups of 15 permeables and 15 impermeables.

The postulated satiation effect was determined for each *S* by comparing the proportion of common and uncommon responses made under each condition. If the proportion of uncommon to common were greater under the prolonged exposure condition than under the control, satiation effect was assumed for that *S*.

Results

Results appear in Tables 2 and 3. Table 2 indicates a substantial difference between the personality types in the effect of the satiation procedure. Impermeable individuals tend to respond with more uncommon words after prolonged exposure of the stimulus word than under the control procedure, whereas permeable individuals do not show such an effect. Mean number of common and uncommon responses of both personality types under both conditions appears in Table 3. While

[2] The comparison was effected by using Eysenck's data (2, p. 63–67) on *16 Personality Factor Test* correlates of his dimension. We had previously made a similar comparison by using *16 PF Test* scores.

[3] It was suggested by Prof. Irving Anderson that the extended time interval of the satiation procedure allows *S* to be more creative, i.e., to think of an uncommon response. To assess such a possibility, equivalent time for "creative activity" was provided in the above design, i.e., a 20 sec. pause in the control condition to parallel the 20 sec. exposure of the satiation condition. Since the satiation effect still occurred, the alternative explanation appears to be incorrect.

TABLE 2

"PERMEABILITY" IN RELATION TO BALANCE OF COMMON AND UNCOMMON RESPONSES UNDER BRIEF VS. PROLONGED EXPOSURE

Personality Type	C/UC	
	Higher	Lower
Permeable	4	11
Impermeable	10	5

$\chi^2 = 10.31$;* $p < .01$.
* Yates' correction for continuity.

TABLE 3

MEAN RESPONSE FREQUENCY IN RELATION TO "PERMEABILITY" AND DURATION OF EXPOSURE

Personality type	Response	Duration of Exposure	
		Satiation	Control
Permeable	Common	5.0	5.1
	Uncommon	5.0	4.9
Diff.		—	.2
Impermeable	Common	4.1	5.9
	Uncommon	5.9	4.1
Diff.		1.8	1.8
t		1.86	1.97
$p <$		.08	.06

permeable (sensitive, sociable, flexible) individuals show no difference in response between conditions, impermeables (rigid, methodical, withdrawn) shift from predominantly *common* responses under the control condition to predominantly *uncommon* responses under the satiation condition. Note, however, that the permeables tended to produce more uncommon responses under brief exposure than impermeables did—4.9 vs. 4.1.[4]

CONCLUSIONS AND IMPLICATIONS

If increased uncommonness of response to word-association items with prolonged exposure may be attributed to satiation, the following conclusions may be drawn with respect to the *S*s of these studies:

1. Associative activity in thinking is a function of satiation.

2. Satiation operates differentially in accord with personality structure as represented, in the present case, by the dimension, "permeability." The present findings are congruent with a response probability theory of conceptual processes. In brief, a hierarchy of potential responses may exist. With continued exposure to a stimulus word, each response in order will tend to be aroused and then to become refractory. In time, distantly related response words will occur. Recovery of the original response may be more rapid in permeable (sensitive, imaginative) than in less permeable individuals.

[4] Viewing conditions were inferior for one of the groups due to distance of the screen, inadequate contrast of image and ground, and external noise. Much more pronounced results were found with the second group. No replication was attempted since results were adequate and subjects difficult to obtain.

SUMMARY

Verbal and personality correlates of the visual satiation process were studied by means of a visually presented word-association test. The following hypotheses were confirmed:

1. Prolonged visual exposure of a stimulus word results in a word-association response less common than that elicited under brief exposure.

2. Individuals categorized as "permeable" (sensitive, flexible, imaginative, extravert) and "impermeable" (less sensitive to stimuli, rigid, withdrawn, introvert) differ with respect to satiation effects.

The results are congruent with a response probability theory of conceptual processes.

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UNDERSTANDING AND SIMILARITY IN MARRIAGE[1]

RAYMOND J. CORSINI
University of Chicago

THE present study is an investigation of some correlates of happiness in the marriages of 20 university-student couples. The specific objective was to determine the relationship between certain social perceptions and marital happiness.

The first objective study of marriage appears to have been by Davis (5) followed by a number of others, the most complete being by Terman (14) and Burgess and Cottrell (3). These studies were concerned with finding correlates of marital happiness and with predicting happiness from social and psychological data. Multiple correlations in the neighborhood of .5 were reported by these investigators. Later studies by Kelly (9), Preston, Peltz, Mudd, and Frosher (11) and Dymond (7) focused on "social perception" as a determinant of happiness.

Kelly found that happy couples were more alike in their self-perceptions, and that they rated themselves and their mates more favorably than did unhappy people. Preston *et al.* observed that happy people tended to perceive themselves and their mates as being more alike than unhappy people. Dymond's investigation suggested that happiness in marriage was related to understanding. Understanding was defined in the latter study as the accuracy of prediction by a husband or a wife of the mate's self-description on a personality questionnaire. She also found that happiness was related to similarity of self-perceptions.

THEORY AND HYPOTHESES

A number of psychologists have been progressing toward the formulation of a general theory of human behavior embracing three aspects: perception, behavior, and consequences. Stated in simplest terms, consequences, such as happiness, are a function of behavior which in turn is a function of perception. An example of this kind of theory is offered by Rogers (12), derived from the most part from experience and research in psychotherapy. This nascent theory may be summarized by Rogers' statement that, "The organism reacts to the field as it is experienced and perceived. This perceptual field is, for the individual, reality" (12, p. 484).

It may be postulated that satisfaction in marriage is a function of behavioral interactions of couples which in turn are determined by social perceptions. If perceptions can be understood, then behavioral and affective consequences may be predicted.

Perception of what? Any individual's reality consists of myriad perceptions. Possibly the most important is that which James (8, ch. 9) has called the "me" or "empirical self." Rogers, who defines self as "awareness of being" (12, p. 498) describes it as follows:

> ... an organized, fluid, but consistent conceptual pattern of perceptions of characteristics and relationships of the "I" or the "me" together with values attached to these concepts" (12, p. 498).

In much the same way that a person has a perception of self, he has a perception of "other." Operationally, the self and the other may be considered equivalent to an evaluation of traits. In self-perception an individual, in effect, ranks and rates his own traits; and in other-perception he does the same for another. Sarbin states, "The ultimate units of the self are inferred qualities, the conceptualization of which is aided by the use of qualifying terms such as adjectives" (13).

Relation of self and other. Social behavior may be considered a function of mutual social perception. Dymond states, "In any social relationship the acts of the other as well as those of the self are incorporated by each party to the interaction as each sees them" (6). Borgatta comments, "In social interaction the response of the individual is dependent not only on his perception of *his* response to others, but also on the perception of the response *of others*" (2).

Identification of perceptions. A standard system of notations will be used to identify

[1] Based on a thesis submitted to the Department of Psychology of the University of Chicago in partial fulfillment of the requirements for the degree of Doctor of Philosophy, Sponsors: Joe Kamiya, chairman, Lyle V. Jones, and Carl R. Rogers.

TABLE 1
CHARACTERISTICS OF SAMPLE

Variable	Husbands		Wives	
	Mean	*SD*	Mean	*SD*
Age	30.5	7.9	30.4	7.5
Education	17.4	1.5	15.9	1.5
Years married	6.0	6.3	—	—
Children	1.2	.8	—	—

social perceptions and predictions in marriage. A husband will be symbolized by H; a wife, by W. Perceptions are designated by two-letter combinations, such as HH; and predictions are designated by three-letter combinations, such as HWW. The combination HH represents a husband's self-perception, an HWW represents the husband's prediction of the wife's self-perception. Listing the various perceptions and predictions, we have:

HH & WW	Self
HW & WH	Other
HWW & WHH	Mate's self
HWH & WHW	Mate's other

Certain relationships between the perceptions and predictions are suggested by the general theory. Using the symbol "x" to denote "compared with," we have:

HH x WW	Similarity (of self-perception)
HH x WHH & WW x HWW	Understanding (of mate's self)
HW x WHW & WH x HWH	Understanding (of mate's other)

Hypothesis I

It is hypothesized that happiness in marriage is a function of understanding, as measured by the degree of relationship between (*a*) a primary perception of self or other versus (*b*) a prediction by the mate of that primary perception. *Happiness in marriage is a function of the understanding of the mate's self and other.* (Happiness is a function of the congruence of HH x WHH, HW x WHW, WW x HWW and WH x HWH.)

Hypothesis II

A number of psychologists have suggested that understanding between people is a function of the similarity of personalities of the individuals. Murray states, "A man . . . errs least when he judges someone who actually does resemble him" (10, p. 277). Allport comments, "The most general rule is that one understands best those personalities that are like one's own" (1, p. 513). From this, a second hypothesis may be derived. *Understanding between a husband and a wife is a function of the degree of similarity of the two selves.* (HH x WHH, HW x WHW, WW x HWW, and WH x HWH are a function of HH x WW.)

Hypothesis III

From prior research studies, a third hypothesis is suggested. *Happiness in marriage is related to similarity of the selves of the partners.* (Happiness is a function of HH x WW.)

METHOD

Subjects. Names of married students were obtained from the Registrar's office of the University of Chicago. Letters were sent to these students, taking them alphabetically, until a total of 20 volunteer couples was obtained. To obtain this predetermined number of *S*s, 150 letters were mailed. Table 1 describes this population with respect to age, education, length of marriage and number of children. No information exists concerning the possible difference of this sample with the married student body at large.

The criterion. The criterion measure of marital happiness was a 26-item test devised by Burgess and collaborators called "General Satisfaction of Self and Concept of Mate's Satisfaction in Marriage"[2] (4, p. 488). Previous research (4) indicates that this test is reasonably reliable and valid.

Social perceptions. To obtain measures of perceptions of self and other, and predictions of the mate's self and other, the writer constructed a 50-item adjective Q sort in such manner as to eliminate or reduce certain undesirable characteristics.[3, 4] The words were sorted

[2] This test, a part of the battery of tests concerned with measuring various aspects of marital relationships, was selected because it contained items measuring only marital happiness and not any aspects of congruence of perceptions which might confound and unduly affect correlations with measures of similarity and understanding. Correlations between the couples of this investigation for happiness was .82 (rho). The test is used with the kind permission of Dr. Burgess.

[3] A separate publication is in preparation to explain the construction of the Q sort. Words were selected from various sources and operations were performed to: (*a*) have words in various of the presumed factors of personality, (*b*) to reduce the favorability or unfavorability of the connotations, (*c*) to reduce equivocality of meanings, and (*d*) to reduce stereotypy. Examples of words rejected are: cold, stingy, cruel, fair-minded, honest. Examples of words accepted are: daring, resourceful, jealous, stubborn, worrying.

[4] The list of words used in this study plus associated material has been deposited with the American Docu-

by *S*s along a continuum of perceived applicability in 10 piles of 5 words each. Comparisons between sorts were made by means of the Pearson product-moment coefficient. For example, the coefficient of correlation between a husband's self-sort and his wife's prediction of her husband's self-sort (HH × WHH) was an index of the degree of understanding of the husband's self-perception by the wife.

Testing procedures. Couples were tested simultaneously under supervision to prevent unwarranted communications. The examiner, with appropriate variations, said the following: "The purpose of this investigation is to gain further understanding of some psychological factors in marriage. The procedures are of two kinds: answering questions in a booklet and distributing adjectives. All material in the questionnaire will be kept in strict confidence, even from your own mate. The other procedure, the sorting of words, will be made available to you and to your mate if you wish."

The sorting for self was done first, then came the questionnaire, followed by the other three sortings. Testing typically took two hours. The instructions for the four Q sorts were essentially as follows:

Self. "These adjectives apply to all people to some degree. Look them over and separate them into ten piles of five words each about yourself, with words that describe you well placed at one end and those words that do not describe you well placed at the other end."

Other. "Now, describe your husband (or wife) as you think he (or she) really is."

Mate's self. "Distribute the words the way you think your husband (or wife) distributed them for himself (or herself)."

Mate's other. "Distribute the words the way you think your husband (or wife) distributed them about you."

RESULTS

To obtain measures of relationships between the variates, the Spearman rank-difference correlation formula was used. With 20 pairs of ranks, a rho of .43 is significantly different from zero at the .05 level and a correlation of .55 is significantly different from zero at the .01 level. To obtain averages of correlations, Fisher's *z* transformation was employed.

Stereotypy. In constructing the Q sort, an attempt was made to eliminate grossly stereotyped words. Nevertheless, one may expect a certain amount of commonality of agreement when these words are sorted by diverse people. To obtain measures of the stereotypy of the Q sort, self-sorts of *S*s were correlated. The mean correlation of the self-sorts of all men (190 comparisons) was .33. The mean correlation of self-sorts of all women (190 comparisons) was .32. The mean correlation of all men vs. all women (380 comparisons) was .28. The mean correlation of self-sorts between the couples was .31. It may be concluded that the couples of this population, with respect to self-perceptions, as measured by the Q sort, are no more alike than couples at random.[5]

TABLE 2

INDICES OF UNDERSTANDING FOR COUPLES AND RANDOM NONCOUPLES

(Means of product-moment correlations obtained by *z* transformation)

Understanding	Couples	Non-couples
Husband's self (HH x WHH)	.61**	.38
Wife's self (WW x HWW)	.64**	.22
Husband's other (HW x WHW)	.62**	.24
Wife's other (WH x HWH)	.65**	.28

** Significant at the .01 level.

Validity of the Q sort. The question arises whether husbands and wives really understand each other. In Table 2 are presented the means of correlations for the couples for the various predictions of perceptions, and also the means of correlations for four sets of randomly selected noncouples for the same relationships. The means of the prediction correlations between couples are higher in every case than for noncouples, a finding which gives some assurance that relationships between various predictive Q sorts of people who know each other are a function of acquaintanceship and may thus be credited to understanding. It will be noted that the noncouple correlations are close to the stereotypy values reported above. Men and women do not differ with respect to ability to understand mates, and perceptions of self and of other are equally well predicted.

Hypothesis I

Table 3 reports the rank-order correlations between the happiness scores and the various understanding scores. It appeared at first that

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[5] The procedure employed to decide whether the differences of the central tendencies of two sets of rho were significant was suggested by Dr. L. V. Jones. The method includes locating the median of one set of rhos and then comparing its magnitude with the value of the rho of the other set at a point predetermined in terms of the significance level decided on.

TABLE 3

RANK-ORDER CORRELATIONS BETWEEN MARITAL HAPPINESS AND UNDERSTANDING

Understanding	Happiness				
	Husband	Wife	Couple	Non-couples	Non-couples
Husband's self (HH x WHH)	.66**	.45*	.60**	.75**	.48*
Wife's self (WW x HWW)	.12	.16	.24	.12	.26
Husband's other (HW x WHW)	—.10	—.11	—.02	—.21	—.03
Wife's other (WH x HWH)	.64**	.62**	.68**	.77**	.71**

* Significant at .05 level.
** Significant at .01 level.

the data in the first three columns of the table were consistent with the hypothesis since 6 of the 12 rhos were significantly different from zero. However, the peculiar disparity of the correlations, with 6 significant and 6 quite nonsignificant, led to the question whether the significant correlations indicated a real relationship between certain kinds of understanding between couples and happiness, or whether the results were due to mutual covariation with unknown variables. To test this, each of the four sets of Q sorts by the husbands were correlated with appropriate Q sorts by women selected randomly without replacement from among the women other than the husbands' own wives. The 20 correlations within each set were ranked and compared against happiness scores. Results were so unexpected that a replication was performed. Results of the two random samples of noncouples are seen in the final two columns of Table 3. It appears that the relationships between happiness and understanding for couples are no greater than for noncouples who do not even know each other.

The only correlations between understanding and happiness that are significant in Table 3 are those in which the husband is the subject of the predicted sort. At first it might appear that the role of the husband as conceived by both the man and the woman in the marital relationship is crucial to happiness, but the fact that similar results were obtained with noncouples was a clue that the relevant relationship may exist between marital happiness and a stereotyped conception of the husband. A mean correlation was therefore obtained of every man's Q-sort correlation for self with every other man. The same was done for

TABLE 4

CONFORMITY OF SELF-PERCEPTIONS WITH THE SAME SEX IN RELATION TO MARITAL HAPPINESS
(Rank-order correlations)

Happiness	Conformity of self-perception	
	Husbands	Wives
Of husband	.75**	.19
Of wife	.60**	.10
Of couple	.65**	.16

** Significant at .01 level.

women. The mean correlation of any individual against others of his own sex may be interpreted as an index of "conformity" of self-perception. These conformity indices were ranked and correlated against marital happiness scores with results as seen in Table 4. It is evident that expressions of marital happiness are associated with certain conforming self-conceptions of men but not of women. The implication of this finding is that for a marriage to be rated as happy the husband must be a stereotyped or conforming individual. Apparently women may differ from the others of their sex without affecting marital happiness.

Hypothesis II

The second hypothesis, that understanding depends on similarity of personality, was tested by ranking and correlating the correlations for similarity and understanding. The data in the first column of Table 5 suggest that this hypothesis is not sustained with the possible exception of understanding HH, the husband's self-concept. Since it appeared that results might be less equivocal if, as before, the relationships between the two variates were

TABLE 5

SIMILARITY IN RELATION TO UNDERSTANDING
(Rank-order correlations)

Understanding	Similarity	
	Couples	Non-couples
Husband's self (HH x WHH)	.53*	.40
Wife's self (WW x HWW)	.22	.31
Husband's other (HW x WHW)	.28	.21
Wife's other (WH x HWH)	.38	.33
Mean rho	.36	.30

* Significant at .05 level.

TABLE 6
SIMILARITY IN RELATION TO MARITAL HAPPINESS

Marital Happiness	Similarity	
	Couples	Non-couples
Husband's happiness	.64**	.02
Wife's happiness	.73**	−.01
Couple's happiness	.75**	.06

** Significant at .01 level.

tested with random noncouples, new samples of 20 pairs of noncouples were drawn for each of the four comparisons with respect to understanding. The correlations for understanding were ranked with the correlations for similarity for these noncouples. The resulting rhos are to be found in the second column of Table 5. The magnitude of relationships for similarity and understanding are about the same for couples and noncouples, contrary to the hypothesis.

Hypothesis III

The third hypothesis, that happiness in marriage depends on similarity of personality, was tested in the same manner as the previous two hypotheses. Similarity correlations were ranked and compared with the ranked ratings of happiness. Results consistent with the hypothesis are seen in the first column of Table 6. To check the possibility of artifacts, three new samples of randomly matched noncouples were drawn and parallel relationships were determined. The results for noncouples are close to zero, and give evidence for the probable validity of the hypothesis.

DISCUSSION

Of the three hypotheses of this study, only the third was sustained by the data. Perhaps the oldest theory of marital happiness is that of homogamy. The data of this study confirm this view when put in terms of personality, and support the earlier findings of Kelly (9), Preston *et al.* (11), and Dymond (7).

The hypothesis that understanding depends on similarity of personality was not sustained by the data. Only one of four sets of correlations departed significantly from zero, but even in this case control data for chance-selected noncouples indicate that almost all of the variance may be accounted for by some unknown artifact. The opinions of Murray (10) and Allport (1) on this point are not supported.

The major hypothesis of the study was that happiness in marriage is a function of understanding the perceptions of the other. Data from marital couples appeared to indicate that marital happiness was related to understanding the role of the husband, but when random sets of noncouples were used, similar results were obtained. The conclusion was inescapable that the results for couples were due to a strong systematic error.

Since the positive and significant correlations always occurred when the husband was the final term of the perception Q sorts, the relationship between conformity of perceptions and expressions of happiness for couples and noncouples was examined. It appeared that happy husbands tend to rate themselves in stereotyped manners. A woman, whether or not she is married to any particular man who is able to predict the stereotype accurately is also predicting his happiness.

The present study raises some doubts about the validity of the conclusions of some other investigations such as those of Dymond (7) and of Winch, Ktsanes, and Ktsanes (15). In neither of these studies were control groups used. The latter found, for example, that couples manifest complementarity of needs beyond chance expectations, without resolving the crucial question as to whether the complementarity obtained is significantly greater for couples than for noncouples.

The variables of the present study have been conceived in antecedent-consequent relationship on prior theoretical grounds. Thus, the interpretation is advanced that people who are similar are more likely to be happy in marriage than people who are dissimilar. The opposite interpretation, equally compatible with the present data, is that people who are happily married tend to become similar with respect to their self-perceptions. Which of the two accounts is the correct one, or whether both trends exist in marital happiness, is a problem for further investigation.

SUMMARY

Twenty couples, at least one member of each being a student at the University of Chicago, were given a series of tests which included a measure of marital happiness and estimates of

perceptions of the self and of the mate, and predictions of the mate's self and the mate's other. Relations between perceptions, predictions, and estimates of happiness were determined by rank-order correlations. As a control, every conclusion with respect to couples was checked by drawing random samples of noncouples, and the same operations for couples were duplicated. The following conclusions appear to be justified:

1. There is no evidence that happiness in marriage is a function of understanding the mate.

2. There is no evidence that understanding the mate is a function of similarity of the selves of the mates.

3. The evidence indicates that happiness in marriage is associated with similarity of self-perceptions of the mates.

4. Husbands and wives are no more similar in their self-perceptions than randomly paired men and women.

5. Happiness in marriage is related to the conformity of men to self-perceptions of their sex. This relationship does not hold for women.

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PSYCHOTHERAPIST'S ANXIETY LEVEL, SELF-INSIGHT, AND PSYCHOTHERAPEUTIC COMPETENCE[1]

ALBERT BANDURA

Stanford University

THE bulk of the research in psychotherapy has been largely patient oriented. Although the personality characteristics of the psychotherapist have been generally assigned a crucial role in the treatment process, comparatively little attention has been given to the systematic study of the therapist variable (5, 9). The present investigation was designed as a preliminary study of one aspect of this problem, the relationship of the therapist's anxiety level and degree of self-insight to his psychotherapeutic competence.

It is generally agreed that anxiety serves as an important motivational determinant in the development and maintenance of maladaptive behavior and that the effectiveness of psychotherapy depends upon the modification or elimination of the patient's underlying anxieties. Thus the patient's anxieties and the defenses developed against them constitute the focus of the therapeutic interviews. The therapist's permissive and nonanxious response to the patient's anxious and conflictful expressions provides one of the important conditions that lead to the alleviation of the patient's anxieties (2, 6). In practice, however, this ideal is not always attained since the common anxiety-provoking situations for the patient are likely also to be anxiety-laden for everyone to some degree, including the psychotherapist (2, 11). When the patient expresses tendencies that are threatening to the therapist, the anxieties so elicited often motivate a variety of responses in the therapist designed at avoiding the anxiety-producing interaction (2, 4, 8, 10). The most frequent reactions observed and described include therapist-initiated interruptions in the form of questions that serve to divert the discussion, premature interpretations that block the patient's expressions, paraphrasing the patient's statements without essential clarification, unnecessary reassurance, unwitting disapproval, etc. Such reactions not only may impede the progress of psychotherapy but may actually produce a negative therapeutic effect by reinforcing the strength of the patient's anxieties.

With regard to insight, which is interpreted to mean that the cues to the individual's motivations and behavior have verbal-ideational representation, it is assumed that such symbolization facilitates discriminative, planful, and voluntary behavior (2, 13, 14). If this is the case, then the therapist who is aware of the cues to his anxieties will be better able to control consciously and adapt his reactions for therapeutic ends and thereby function at a more effective level than will the therapist who lacks such insight.

It is, therefore, reasonable to assume that the therapist's anxieties and lack of insight into his anxieties will influence his ability to do effective psychotherapy. The specific hypotheses which were tested in the present investigation were that (*a*) competent psychotherapists are less anxious than those who are judged to be less competent, and (*b*) competent psychotherapists possess a greater degree of insight into the nature of their anxieties than do the less competent therapists.

METHOD

Subjects. A total of 42 psychotherapists, of whom 32 were clinical psychologists, 8 psychiatrists, and 2 psychiatric social workers, participated in the project. The clinical settings represented in the study included a child guidance clinic, a community psychological clinic, a university student counseling center, and a V.A. neuropsychiatric hospital.[2] Although there was variation among the four groups with respect to the amount and type of therapeutic experience, the vari-

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ability within groups was relatively small. Since the therapists within a given group were of the same general level of training, differences in psychotherapeutic competence that might be due to differing amounts of experience were essentially controlled.

Ratings. Anxiety and insight measures were obtained for three central conflict areas—dependency, hostility, and sexuality. Each of the anxiety variables was represented by descriptive statements defining low, medium, and high degrees of anxiety with respect to dependency, hostility, and sex. An attempt was made to define each of these variables in terms that were descriptive of overt behavior although inferences from observed behavior were also included. The definition of the dependency-anxiety variable is given as an example.

Low

When faced with situations he is unable to handle he seeks help. Can turn to others for help and support when needed. Or may show an overdependent attitude, constantly seeks help and support without feeling uneasy about it.

Medium

Maintains an independent attitude. Tries to handle matters alone, feels uneasy about accepting help or support. Fearful of having to remain in a dependent position.

High

Strongly refuses help and denies any need for it. Never allows himself to become involved in a dependency relationship. May also express his strong denial of dependency needs by an exaggerated, self-sufficient, independent facade.

Each psychotherapist in a group ranked all therapists including himself with respect to anxiety level on each of these three variables as defined. A rank of 1 was assigned to the therapist who was judged to be the most anxious of his group, and the bottom rank was assigned to the least anxious. In a few instances where a particular therapist had limited interaction with some member or members of his group, he ranked only the therapists with whom he felt adequately acquainted. The assigned ranks were consequently converted into standard scores with a mean of 5 and a standard deviation of 2 to make the data from the different groups comparable. The standard scores thus obtained from the rank data constitute the ratings.

The anxiety measure was determined by averaging the ratings assigned to a therapist by his associates on each of the three variables. The insight measure was defined in terms of the relative discrepancy between a subject's self-rating and the average group rating for that subject (group minus self). A person whose self-rating was equal to or higher than the mean group rating was considered to be aware of his anxieties. On the other hand, a self-rating which was lower than the mean group rating was considered indicative of low insight.

Psychotherapy supervisors' ratings constituted the independent criterion measure. Global ratings of psychotherapeutic competence were obtained from supervisors who had extensive contact with the therapists. Competence was defined in terms of the therapist's ability to facilitate improvement in the adjustment of patients. Each supervisor ranked the therapists he knew well from the most to the least competent with the most competent receiving a rank of one. A total of 13 supervisors made such rankings. Twenty-four of the 42 psychotherapists were ranked by at least 3 or 4 supervisors. Of the remaining psychotherapists, 17 of them received 2 rankings; only one received a single evaluation. The supervisors' rankings were also converted into standard scores. The mean value for each therapist was computed to give the final composite score which served as the criterion measure. Except in three instances, the supervisors had no knowledge of the purpose of the study.

RESULTS

Reliability. In the case of the criterion ratings, the number of ratings a therapist received varied from one therapist to another, and the supervisors were not the same for all the subjects in the sample. The reliability of these criterion ratings was estimated by the use of an analysis of variance technique developed by Ebel (3) for handling such a set of ratings. The degree of agreement among the supervisors tended to be high with the coefficient of reliability of the average ratings for the sample being .84.

Similarly, in the therapists' ratings of each other, the raters were not the same for all persons in the sample. As a measure of reliability, Horst's (7) generalized reliability formula was used which provides an estimate of reliability for such a set of measures. The reliability coefficients for the group were .82 for dependency, .86 for hostility, and .82 for sex. There appears to be no way of determining the reliability of the insight measure. The ratings from which it is derived seem to be clearly reliable.

Intercorrelations of measures. The anxiety and the insight measures were intercorrelated in order to determine whether anxiety and insight were generalized or primarily specific to a given area of adjustment. These correlations are presented in Table 1. Dependency, hostility, and sex are represented by D, H, and S in the table.

The intercorrelations among the anxiety ratings were found to be of moderate degree with the average of the z values yielding a mean intercorrelation of .46 ($p < .01$). No significant relationship appeared, however, between dependency-anxiety and hostility-anxiety.

TABLE 1

INTERCORRELATIONS OF THE ANXIETY AND INSIGHT MEASURES

Correlated Variables	Anxiety			Anxiety (Self-rating)			Insight		
	D	H	S	D	H	S	D	H	S
Anxiety									
Dependency		.17	.55**	.22					
Hostility			.62**		.45**				
Sex						.36*			
Anxiety (self-rating)									
Dependency					.09	.20			
Hostility						.36*			
Sex									
Insight									
Dependency							−.29	.25	
Hostility								.13	
Sex									

* Significant at the .05 level.
** Significant at the .01 level.

TABLE 2

PRODUCT-MOMENT CORRELATIONS OF ANXIETY AND INSIGHT VERSUS PSYCHOTHERAPEUTIC COMPETENCE

Correlated variables	r
Anxiety	
Dependency	−.36**
Hostility	−.58**
Sex	−.62**
Anxiety (Self-rating)	
Dependency	−.28
Hostility	−.17
Sex	−.16
Insight	
Dependency	.29
Hostility	−.11
Sex	−.05

** Significant at the .01 significance level.

The intercorrelations among the self-ratings of anxiety and among the insight measures were found to be low and insignificant. The average intercorrelation of the self-ratings of anxiety was .22. Only the correlation between the self-ratings of hostility-anxiety and sex anxiety met the criterion of significance at the .05 level of significance.

Both the direction and the magnitude of the discrepancy score is partly a function of the subject's anxiety level. Individuals judged to be very low on anxiety can receive only negative discrepancy scores, whereas highly anxious individuals can get only positive scores. Therefore, the intercorrelations of the insight measures were calculated with the effect of the respective anxiety levels partialled out of the discrepancy scores. These intercorrelations among the insight measures were found to be nonsignificant (mean intercorrelation of .03), which suggests that insight, as measured in this study, tends to be specific to a given area of adjustment.

Correlations were also computed between the two measures of anxiety (Table 1). Positive relationships were obtained between the group rating of a particular individual's anxiety level and the individual's self-rating of anxiety with the correlation of the means of the two sets of measures being .43 ($p < .01$). No significant relationship appeared, however, between the two sets of dependency-anxiety measures.

No correlations are available between the anxiety ratings or the self-ratings of anxiety as against the insight measure since these measures are not operationally independent and the correlations between them would be spurious.

In testing the hypotheses advanced concerning the relationship between the therapist's anxiety level and self-insight and his psychotherapeutic competence, product-moment correlations were computed between these variables and the criterion measure. Table 2 presents the relationships among these variables.

In the case of the anxiety and insight measures, since predictions were made concerning the direction of the relationships, a single-tailed test of significance was used. The anxiety measures associated with dependency, hostility, and sex correlated significantly with the criterion measure of psychotherapeutic competence. The corresponding multiple correlation was of the magnitude of −.69 ($p < .01$). These results tend to support the hypothesis that therapeutic competence and anxiety are inversely related.

No hypothesis was advanced concerning the relationship between the therapists' self-ratings of anxiety and the ratings of psychotherapeutic competence because a given individual's self-rating may signify a fairly accurate estimate or it may reflect poor insight regarding his own anxieties. Such self-ratings, therefore, are difficult to interpret. Empirically, their relationships with the criterion are not statistically significant.

With regard to insight, the part-correlation method was used in order to determine the

degree of relationship between the psychotherapy competence ratings and the insight measure with the effect of anxiety level partialled out of the insight measure. None of these correlations was found to be statistically significant.[3]

DISCUSSION

Because of the interpersonal nature of psychotherapy, the personality characteristics of the therapist are often regarded as one of the most important variables in determining the effectiveness of psychotherapy. This has often led therapists to regard psychotherapy as an art. If what is meant by this is that the therapist's personality may serve to facilitate or impede his attempts to apply the psychotherapeutic procedures, then it should be possible to isolate and to study systematically the manner and degree to which various therapist variables contribute to the treatment process.

The findings of the present study offer partial support for the hypothesis that the therapist's anxiety is related to his psychotherapeutic competence. Anxious therapists were rated to be less competent psychotherapists than therapists who were of low anxiety. These results are consistent with Luborsky's (9) finding that the degree of anxiety differentiated therapists of low and high competence with the lows characterized as more anxious than the highs.

The results fail to establish any significant relationships between insight and psychotherapeutic competence. While it must be remembered that the insight measure covered a very narrow aspect of the therapist's total behavior, this lack of relationship raises the question as to how much the sheer recognition of cues to anxiety lessens the anxiety or leads to modification in behavior.

Finally, the results do not reveal any relationships between the therapists' self-ratings of anxiety and psychotherapeutic competence. None of the correlations here was statistically significant.

Some of the limitations of this study should be recognized. For example, the therapists in this study were relatively young professionally, averaging approximately two years of therapeutic experience. The criterion of psychotherapeutic competence was based on supervisors' ratings rather than upon the direct study of the patient-therapist interaction and the resultant outcomes, although the therapists' interview recordings, process notes, and actual success with patients were factors upon which the supervisors based their ratings.

Further research is needed in order to determine the specific way in which the therapists' anxieties affect his psychotherapeutic work. This would involve an intensive analysis of the actual patient-therapist interaction. For example, a study of the approach-avoidance tendencies of high and low anxious therapists in dealing with emotionally charged material is being planned.

SUMMARY

The present study was designed to test the hypothesis that competent psychotherapists are less anxious and possess a greater degree of insight into the nature of their anxieties than do psychotherapists who are judged to be less competent.

A total of 42 psychotherapists representing four clinical settings participated in the study. Each psychotherapist in a group rated all therapists including himself as to degree of anxiety with respect to dependency, hostility, and sex. The average rating assigned to a psychotherapist by his associates on each of the three variables constituted the anxiety measure. The insight measure was defined in terms of the relative discrepancy between the psycotherapist's self-rating and the average group rating for the therapist.

Psychotherapy supervisors' ratings constituted the independent criterion measure of psychotherapeutic competence.

The results obtained were as follows:

1. Significant negative relationships of moderate degree were obtained between the psychotherapists' anxiety level and ratings of psychotherapeutic competence. Anxious therapists were rated to be less competent psycho-

[3] It might be argued that a wide discrepancy in either direction would be indicative of low insight and therefore, the absolute discrepancy score would be a more appropriate insight measure. However, the part-correlations of this measure with the ratings of therapy competence were also found to be low and statistically nonsignificant, (dependency −.11, hostility −.20, sex −.17).

therapists than therapists who were low in anxiety.

2. The findings revealed no significant relationships between the therapists' degree of insight into the nature of their anxieties and ratings of psychotherapeutic competence.

3. No significant relationships were found between the therapists' self-ratings of anxiety and ratings of their psychotherapeutic competence.

The results were interpreted as indicating that the presence of anxiety in the therapist, whether recognized or not, affects his ability to do successful psychotherapy and that insight into his anxieties alone is not sufficient.

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THE AVOIDANCE OF THREATENING MATERIAL IN IMAGINATIVE BEHAVIOR[1]

WILLIAM ABBOTT SCOTT

University of Colorado

SINCE its original development as an aid to clinical assessment of global personality configurations, the Thematic Apperception Test has gained increasingly widespread use in laboratory studies of personality traits. Modifications in administering and scoring procedures have been devised to yield relatively objective measures of various specific traits, which are studied one at a time, rather than as aspects of more complex configurations.

Perhaps the most extensive use of the TAT approach within an experimental setting has been in the investigation of complex human motives, such as the need for achievement (2, 6, 10, 11). Focusing on a single trait at a time has permitted researchers to specify in relatively precise fashion certain determiners of imaginative behavior deemed relevant to that trait and to its manifestations in the imaginative stories. The research to be reported here likewise deals with isolated personality traits, measured by specific categories of story content. Its approach is not primarily motivational, however, but stems more from a perceptual or cognitive point of view.

In the studies cited, the theoretical formulations from which the scoring categories were derived have generally posed the problem in some such terms as: "What sorts of personal and situational factors lead subjects to approach a given class of goal objects?" Accordingly, these formulations have, for the most part, dealt with factors that could account for the "approach" of an *S* toward the critical thematic content under investigation; and the picture stimuli have most frequently been designed to represent positively valenced situations.

Recently certain investigators (see, for example, 2) have become concerned with a correlative problem: "What happens when a person is confronted with a pictorial situation that represents a threat rather than a goal, or represents simultaneously a goal and a threat?" The present research deals with this problem, by means of the following experimental paradigm: The *S*s are asked to write or tell imaginative stories about series of ambiguous pictures under two different conditions. The first condition (low cues) provides no intentional suggestion as to what the content of the stories should be. The second condition (high cues) for the same *S*s, focuses their attention on a particular event, which may be threatening to some of them.

What is the probability of the *S*'s producing stories with the critical thematic content in response to high cues, as compared with low cues? Here a formulation of the problem is considered which represents a generalization of Miller's approach-avoidance conflict theory (13). Data are then presented from three separate studies which tend to support the suggested formulation.

Miller (13), in describing the overt behavior of animals with respect to an object that represents, simultaneously, a goal and a threat, has used the concepts of goal and threat gradients to account for the observed tendencies of animals to approach the object and at the same time to avoid it. These gradients may be represented schematically as sloping lines on a set of coordinates, the abcissa indicating units of distance from the object (origin of the coordinates), and the ordinate indicating the strength of the animal's approach or avoidance tendency. Tendency to approach or to avoid is at a maximum at the origin (in the presence of the object), and falls to a minimum at some distance away. It is assumed that the threat gradient is steeper than the goal gradient, so that as the animal comes nearer to the critical object from any suitable distance, his tendency to run away from it increases more rapidly than does his tendency to approach it. Differences in heights of the gradients (depending on

[1] This report is based on a dissertation submitted to the Doctoral Program in Social Psychology, University of Michigan (see 20). The study of "Anxiety over War Catastrophe" was done while the author was associated with the Survey Research Center, and several of the Center's staff members participated in its planning and execution. I am especially indebted to Professors J. W. Atkinson, G. S. Blum, and S. B. Withey for their contributions to the suggested theoretical formulations.

levels of fear and drive) determine where the two slopes cross (if at all) and, accordingly, at what range on the abcissa approach behavior occurs, and at what range avoidance. Miller has suggested (14, 15) that "distance from the goal" need not be restricted to the physical space between the animal and the object, but may usefully be applied to other dimensions of stimulus generalization.

The approach-avoidance formulation can be applied to the present problem if the concept "cue strength" be regarded as the inverse equivalent of "distance from the goal-threat." From such an extrapolation follows the hypothesis that, if an *S* is sufficiently afraid of an event represented in the pictures, the stronger the cues for it become, the less likely will he be to talk or write about it in his imaginative stories (since, for him, the threat gradient is higher than the goal gradient in the neighborhood of strong cues). If an *S* has relatively little (or no) fear of the event, an increase in cue strength should be accompanied by an increased likelihood of his telling stories about it.

Three independent studies, dealing with two different kinds of events, yielded data on which this general hypothesis could be tested. The first was a study of imaginative stories told in response to increasingly clear cues relating to war catastrophe; the second and third dealt in similar manner with imaginative responses to competition cues. In all three studies there were sizable proportions of *S*s (17%, 37%, and 48%) who exhibited *decreased* tendencies to talk or write about the critical events in the presence of *increased* cues. The *S*s who displayed such a response pattern will be called *avoiders*; all other *S*s are called *nonavoiders*. To support the approach-avoidance formulation it is necessary to show that the avoidance pattern is associated with fear of the critical event. Evidence of fear was obtained from a content analysis of the imaginative stories.

Evidences of Fear Within Stories

The test of the general hypothesis that fear results in avoidance lies in a comparison of the stories about the threatening event told by avoiders with those told by nonavoiders. Avoidance of critical thematic content in a TAT-type story is regarded as a symbolic defense against anxiety, equivalent to an animal's running away from a fear-arousing object. On those occasions when an avoider remains in the presence of the threatening event, by telling a story about it, he should display symptoms of continuing fear, or anxiety. However, if he escapes from it, by telling a story about another kind of event, the anxiety (and symptoms of it) should be reduced. (The terms *fear* and *anxiety* are here used interchangeably to refer to the *S*'s reactions to a specific, external event which is threatening.)

Current theories of anxiety (7, p. 114; 12, pp. 88, 199) and conventional clinical testing practices (1, p. 203; 3, p. 115; 19, p. 404) suggest that TAT-type stories of an anxious *S* may be identified with the following general characteristics: (*a*) impoverished content, blocking of imaginative production, relatively short length, lack of involvement in the story; (*b*) failure to describe problem-solving behavior of the characters in the story; (*c*) failure to describe a successful outcome. Various operational measures of these general "maladaptive" characteristics were therefore designated for each of the studies. In each case it was predicted that when avoiders *do* tell stories about the threatening event, these critical stories will be more likely to display the designated characteristics than the stories which nonavoiders tell about the threatening event. However, when avoiders tell stories about other kinds of events (nonthreatening), no excess of fear symptoms is expected, since they have removed themselves from the threatening situation; so these nonthreatening stories should not differ from those of nonavoiders on the characteristics mentioned.

FEAR OF WAR CATASTROPHE

The Interview

Four pictures of varying cue strength were presented to 139 respondents in New York and Philadelphia during an interview about problems related to civil defense.[2] Two of them were shown at the beginning of the interview, before

[2] The pictures are on file in the Survey Research Center, University of Michigan, Ann Arbor. They were drawn to represent:

A. Woman looking at sky with birds (or planes).
B. Man on hill overlooking city, with mushroom-like cloud in sky.
C. Woman running with two children.
D. Man standing by gutted house.

there had been any mention of war or civil defense. The remaining two pictures were presented about halfway through the interview, following a series of open questions covering such matters as likelihood of war, danger of enemy attack, degree of damage expected, mortality radius of the atom bomb, amount of personal concern, items of information on attack and defense methods, etc.

The relative cue strengths of the pictures were assessed by twenty-one judges who ranked them according to "the degree to which the picture suggests war catastrophe." Mean ranks were ordered as follows: A (weakest), C, B, and D (strongest). Half of the respondents were shown A and B before the interview, then C and D following the first ten questions; the other half received the pictures in the order, C—D—interview—A—B. The cues from the interview are assumed to have contributed to the total cue strength (re war catastrophe) at the time the second pair of pictures was presented. Accordingly, the war-catastrophe cues were presumably stronger at the time of presentation of the last picture (D or B, depending upon sequence) than for any preceding picture. (This assumption was supported by the data on frequency of war-catastrophe themes for each picture. The frequencies were arranged in precisely the order indicated by the judges.)

The interviewer suggested:

> We're interested in finding out what people can see or imagine in these pictures. I wonder if you'd look at each one and try to imagine what kind of a story might go with it. Just use your imagination in doing this and say whatever comes into your mind. I'll show each of them to you for a few seconds, and then take it away and ask you to tell me about it.

The interviewer took a *verbatim* record of the respondent's story, using the following probes as necessary: "What is this picture about? What is the person thinking? What do you think will happen next? What do you think other people might say it's about?"

Content Analysis of Protocols

The code for analysis of the protocols included various dimensions referring to the content of the story and to the manner in which it was told. Within each dimension were categories relevant to the hypotheses about differences between avoiders' and nonavoiders' protocols. (See Table 1 for descriptions of the dimensions.) The protocols were coded by the regular coding staff of the Survey Research Center, for the most part undergraduate and graduate students untrained in clinical psychology.

Coding reliability indices[3] ranged from $\pi = .30$ to .75, with a mean of .57. These low figures suggest that the categories were not very well defined for the coders, and that considerable subjective judgment entered into their discriminations.

The theme (situation) of each story was classified as either (*a*) war catastrophe (actual or impending), or (*b*) any other theme (including nonwar catastrophes) or "Don't know." The "avoidance" group is composed of respondents who gave war-catastrophe themes for one or more of the first three pictures, but not for the last one (where cues were strongest). The nonavoidance theme patterns are those which include a war-catastrophe theme for the last picture. Twenty-four of the 139 respondents in the sample (17%) were categorized as avoiders of war-catastrophe themes, and 110 were categorized as nonavoiders.

Although the percentage of war-catastrophe themes mentioned by the avoiders was necessarily lower than that of the nonavoiders, the proportion of *all* catastrophe (both war and nonwar) themes was similar for both groups (78% and 80%). Where avoiders failed to mention war catastrophe, they tended to give other than war-catastrophe interpretations (fire, explosion, etc.). The "avoidance" dimension would thus seem to represent fear of *war* catastrophe, specifically, and not generalized fear of all kinds of catastrophic situations.

Results of War Catastrophe Study

The first two columns of Table 1 report the results of the analysis of war-catastrophe protocols. The significant differences between

[3] The reliability index (21) represents the extent to which obtained agreement between two coders exceeds that which could be expected on the basis of chance alone. $\pi = \dfrac{P_o - P_e}{1 - P_e}$, where P_o is the percentage of judgments on which the two coders agree; and P_e is the "expected agreement" (on the basis of chance alone), given the particular distribution of responses among the m categories of the dimension. $P_e = \sum_{a=1}^{m} P_a^2$ where P_a is the proportion of cases assigned to the a^{th} category.

avoiders' and nonavoiders' stories were: (*a*) avoiders tended to tell shorter stories; (*b*) avoiders were less likely to mention spontaneously thinking of the central figure or outcome of the story before these were specifically probed for by the interviewer; (*c*) avoiders were less likely to mention problem-oriented activity of the central figure (e.g., get to shelter, protect others, give relief or aid to others); (*d*) avoiders told fewer stories with successful outcomes. The remaining differences between avoiders' and nonavoiders' protocols were in the predicted directions, but did not reach acceptable levels of significance.[4]

When avoiders and nonavoiders told stories about nonwar catastrophes (e.g., fire or flood), no differences between their protocols were expected, with respect to the characteristics coded here. The first two columns of Table 2 indicate that this expectation was borne out: none of the differences reaches the .05 level of confidence, and the directions of differences are inconsistent.

FEAR OF COMPETITIVE SITUATIONS

Procedure

The general design of the competition studies[5] involved the presentation to the same *S*s of TAT-type pictures under "relaxed" or "neutral" conditions and also under "aroused" or achievement-oriented conditions (see 10, 11). The neutral condition of Study A was produced as follows: On the first day of the semester members of an undergraduate psychology class at the University of Michigan were shown a series of pictures, projected one by one on a screen, and asked to write stories about them. They were given no particular information about the nature of the task. Then the instructor left the room and returned a few minutes later to create the aroused condition. He implied that the class was overcrowded, so it would be desirable for all students to take a general psychology qualifying examination in order to determine whether everyone had the requisite background for the course. Following a fifteen-minute examination period, a second series of pictures was administered, and stories were written as before.

The relaxed condition of Study B was created by the experimenter's presenting some "interesting" tasks to the *S*s (undergraduate psychology students at the University of Iowa), so that he could get data "to see what might be made of them" as tests. The atmosphere was informal and achievement demands were minimized prior to the writing of stories. After a scrambled-words task the pictures were projected on a screen one at a time and *S*s wrote imaginative stories about them. In the aroused condition, a week or more later, *S*s were informed that the tests were measures of "leadership and executive qualifications" and were urged to do their best on them. A different form of the scrambled words test was given, followed by a second series of pictures and imaginative stories. Throughout this second pretest period, formality and specific achievement demands were emphasized.

Thirty-five *S*s from Study A and 62 *S*s from Study B are represented in this analysis. A few *S*s had to be excluded because of incomplete protocol sequences.

Both of these experiments differ from the war-catastrophe study in the lack of systematic grading of pictures in strength of cues with respect to the threatening event. The condition of increasing cue strength required by the theory must therefore be met entirely by a shift in condition from relaxed (or neutral) to aroused.

The subjects were divided into two groups: (*a*) those who gave more competition themes under neutral than under aroused conditions (13 *S*s in Study A; 30 *S*s in Study B); and (*b*) all other *S*s (22 and 32 *S*s in Studies A and B, respectively). The first response pattern

[4] Since protocol length was related to the avoidance criterion, and was, in turn, correlated with some of the other dimensions of the content analysis, it seemed advisable to control for the effects of protocol length when computing the relationship between avoidance and other protocol characteristics. This was done by grouping the protocols according to number of words (two groups in the war catastrophe study, two groups in competition study A, three groups in competition study B), and computing the significance of the difference between avoiders' and nonavoiders' protocols within each group. The significance levels were then combined (9, p. 46). Tables 1 and 2 report the "combined" significance levels, with protocol length controlled, for each of the dimensions which was correlated with protocol length. The codes for content analysis and data from which these summary tables were constructed may be seen in the original report of the research (20).

[5] I am indebted to John Martire (11) and Alfred C. Raphelson (18) for the use of protocols which they had previously collected for research on the achievement motive.

constitutes the operational definition of avoidance for these two studies.

The protocols were coded by the writer and one assistant. Contamination with the avoidance criterion was precluded, since a given *S*'s theme pattern was not known at the time his stories were analyzed. Coding reliability indices ranged from $\pi = .30$ to .82, with a mean of .67.

Results of Competition Studies

The right-hand part of Table 1 presents results of the analysis of competition stories. For each of the two studies, separately, the protocols of avoiders and nonavoiders are compared on characteristics similar to those used in the analysis of war-catastrophe stories. Significant differences in Study A were: (*a*) avoiders tended to tell shorter stories; (*b*) avoiders told fewer stories which were judged as indicating a realistic acceptance of the competition situation; (*c*) avoiders were less likely to mention problem-oriented activity of the central figure (e.g., try to win the contest, build a good tool, etc.); (*d*) avoiders told fewer stories with successful outcomes; (*e*) when failure did occur in the *S*s' stories, avoiders were less likely than nonavoiders to describe a competitive reaction to it on the part of the central figure—e.g., he was more likely to give up than to evidence renewed striving for success. The remaining differences between avoiders' and nonavoiders' protocols in Study A were in the predicted directions, but did not reach the .05 level of significance.

In Study B the hypotheses did not fare so well. In the first place, the average length of avoiders' and nonavoiders' competition stories differed—but in the opposite direction to that predicted: the avoiders tended to tell longer competition stories. When story length is controlled, two of the predicted differences reach the .05 level of significance: (*a*) avoiders were less likely to evidence a realistic acceptance of the competition stiuation; (*b*) avoiders were less likely to mention problem-oriented activity. All the rest of the differences, though in the predicted direction, were small and unreliable. It is quite likely that the failure of

TABLE 1

COMPARISON OF AVOIDERS' AND NONAVOIDERS' PROTOCOLS DEALING WITH THREATENING SITUATIONS

(Entries represent proportions of protocols in each group showing a given characteristic)

Characteristic	War Catastrophe Protocols			Competition Protocols						Combined p-value*
				Study A			Study B			
	Avoiders	Nonavoiders	p	Avoiders	Nonavoiders	p	Avoiders	Nonavoiders	p	
% of stories judged to indicate realistic acceptance of situation	53	72	NS	6	24	.05	18	24	.05	.01
% of stories judged to evidence much imagination	29	34	NS	7	24	NS	30	32	NS	.20
% of stories where thinking or outcome was volunteered before probe	15	30	.05	(not codable in competition protocols)						
% of stories with problem-oriented thinking	25	35	NS	39	55	NS	60	52	NS	.30
% of stories with problem-oriented activity	27	43	.05	22	45	.01	46	60	.05	.001
% of stories with successful outcomes	6	26	.05	13	36	.01	45	59	NS	.005
% of stories with competitive reaction to success	(not coded)			0	18	NS	15	19	NS	.10
% of stories with competitive reaction to failure	(not coded)			8	35	.05	33	45	NS	.02
Mean number of words	(58)	(74)	.01	(46)	(55)	.01	(104)	(94)	.996†	.01

* Significance levels were combined according to the procedure suggested by Lindquist (9, p. 46).

† Significant difference, opposite to predicted direction.

Note.—Significance levels reported here represent the relations between the avoidance criterion and the specified protocol characteristics, with protocol length held constant in every case where it could be a contaminating factor in the relationship. Since directions of differences were predicted, one-tailed t tests were used throughout. See Kish (8, p. 207) and Scott (20, p. 119) for a description of the sampling-error formula used to correct for intercorrelation among several responses from the same subject.

TABLE 2

COMPARISON OF AVOIDERS' AND NONAVOIDERS' PROTOCOLS DEALING WITH NONTHREATENING SITUATIONS

(Entries represent proportions of protocols in each group showing a given characteristic)

Characteristic	Nonwar Catastrophe Protocols		Noncompetition Protocols				Combined p-value
			Study A		Study B		
	Avoiders	Nonavoiders	Avoiders	Nonavoiders	Avoiders	Nonavoider	
% of stories indicating realistic acceptance of the situation	(not coded)		6	11	24	25	.50
% of stories evidencing much imagination	20	25	20	22	46	40	.80
% of stories where thinking or outcome was volunteered before probe	27	24	(not coded)				
% of stories with problem-oriented thinking	37	35	40	55	75	79	.70
% of stories with problem-oriented activity	42	48	26	30	52	44	.60
% of stories with successful outcomes	33	35	4	17	41	34	.40
% of stories with problem-oriented reaction to success	(not coded)		0	0	4	5	
% of stories with problem-oriented reaction to failure	(not coded)		25	22	18	15	.80
Mean number of words	(62)	(65)	(48)	(54)	(102)	(100)	.30

Note.—Significance levels were computed from one-tailed t tests, which test the hypothesis that nonwar-catastrophe or noncompetition problem stories of avoiders and nonavoiders differ in the same manner as was predicted for war-catastrophe and competition stories. None of the differences reported here reaches the .05 level of confidence.

Study B to yield results as supportive as those of Study A is due to the time-lag between the two series of pictures: the neutral and aroused conditions were separated by a period of about a week, and many extraneous factors could intervene to muddy the results. Hypothesis strength and fear strength are not likely to remain constant for that long a time; this would lead to misclassification of avoiders and nonavoiders, and to a consequent attenuation of the predicted relationships.

When avoiders and nonavoiders told stories about noncompetitive situations, their protocols did not differ according to the characteristics coded here. The right-hand side of Table 2 compares the two groups' noncompetition stories. None of the differences reaches the .05 level of significance, and the directions of differences are inconsistent.

DISCUSSION

In the three studies reported here, it was possible to make repeated independent tests of several of the specific hypotheses concerning differences between avoiders' and nonavoiders' stories about threatening events. Altogether, Table 1 represents 23 tests of specific predicted relationships. Eleven of the differences surpass the .05 level of confidence in the predicted direction; one (protocol length in Competition Study B) is significantly opposite to the predicted direction; the remaining eleven differences are in the predicted direction, but fail to attain an acceptable level of significance. Where similar predictions were tested on two or three different studies, it is possible to combine the significance levels of the separate results into combined p values, according to the procedure suggested by Lindquist (9, p. 46). The last column of Table 1 reports these composite results, from which the following conclusions can be drawn:

When avoiders *do* tell stories about events which are presumably threatening to them, their stories differ from those which nonavoiders tell about the same kinds of events. The most reliably discriminating characteristics are: (*a*) protocol length, (*b*) degree of acceptance of the situation described in the story, (*c*) nature of activity described (adaptive, as opposed to nonadaptive or no activity), (*d*) nature of outcome of the situation (successful, as opposed to unsuccessful or no outcome). The rest of the characteristics coded in these studies either did not reliably discriminate avoiders and nonavoiders, or yielded results which were not replicated. Since the directions of differences were quite uniformly as pre-

dicted, it may be assumed that the other characteristics are potential discriminators, provided the empirical categories can be refined and clarified.

These results are specific to stories about the threatening events. When avoiders tell stories about nonthreatening events, their protocols do not differ significantly or consistently from stories which nonavoiders tell about similar kinds of events. Consequently, it cannot be maintained that avoiders react similarly to all kinds of projective story situations. They manifest symptoms of fear within their stories only when these stories deal with threatening events.

The findings thus lend credibility to the approach-avoidance model on which the analyses were based. They are also consistent with findings from certain other recent studies of perceptual and imaginative behavior. Blum (4) demonstrated that *S*s whose attention had been focused on presumably traumatic sexual stimuli were less able to locate these stimuli when presented tachistoscopically at close-to-conscious level (one-fifth of a second) than they were to locate nontraumatic stimuli presented in the same manner, although at a faster speed (.03 sec.) increased perceptual vigilance for the former had occurred. Clark (6) showed a series of TAT pictures to a group of *S*s after they had been subjected to conditions calculated to arouse sexual motivation. Their protocols were analyzed to determine the amount of manifest sex imagery contained in them, and the results from this group were compared with the protocols of *S*s who saw the same pictures under "neutral" conditions (no deliberate sex-arousal). The *aroused* group exhibited significantly less manifest sex imagery than the *neutral* group. This finding indicated that the focusing of an *S*'s attention on sex could arouse enough anxiety to require partial suppression of sex-related symbolic behavior.

Though the model for the present research has been reported in terms of approach-avoidance conflict theory, it is possible to state it in terms compatible with Bruner and Postman's hypothesis-information theory of perception and cognition (5, 16). To their formulation of the approach aspects of cognitive processes one may add variables to account for the avoidance aspects investigated here, resulting in a theory which applies to either threatening or nonthreatening events, as follows:

The net tendency to report the presence of event X in a stimulus situation is the resultant of two opposite tendencies, approach and avoidance. When the avoidance tendency is stronger, X is not reported. When the approach tendency is stronger, X is reported, providing other net approach tendencies are not still stronger. (It is necessary to consider alternative approach tendencies, since a single stimulus may include cues relevant to two or more kinds of events, say X, Y, and Z. So an S's report of Y does not necessarily indicate an avoidance of X, but may merely mean that Y is more salient than X; or, in the present terminology, that his net approach tendency with respect to Y is stronger than that with respect to X.)

The approach tendency with respect to X is a function of (*a*) the strength of the S's hypothesis that X will occur and (*b*) the degree of structuring of the cues with respect to X.

The avoidance tendency with respect to X is a function of (*a*) the amount of fear associated with X, and (*b*) the degree of structuring of the cues with respect to X.

For a given level of hypothesis strength, the approach tendency increases monotonically as the cue strength is increased. For a given level of fear, the avoidance tendency also increases monotonically as the cue strength is increased. But with increasing cue strength, the avoidance tendency increases more rapidly (has a greater acceleration) than the approach tendency. Thus, as strength of cues is increased, from very weak to very strong, the avoidance tendency *may* overtake the approach tendency, so that the net tendency shifts from positive to negative. Whether or not this occurs depends on the relative strengths of hypothesis and fear.

If an S has no fear of event X, the net tendency in the presence of adequate cues is always positive. And it remains positive even in the face of a minimal amount of fear, providing there is a moderate degree of hypothesis strength, and that the cues do not become too strong.

Given considerable fear of X, it is possible, at least theoretically, to increase the cue strength to the point where the avoidance tendency becomes predominant, and the S no longer reports the presence of X. (The qualification, "at least theoretically," is introduced because in the present TAT-type experiment, it may be impossible to make any picture represent the threatening event well enough to elicit the requisite amount of fear.)

If an S is characterized by extreme fear of X, it is possible that any level of cue strength, no matter how weak, may elicit an avoidance tendency which is stronger than the approach tendency. Thus, the two gradients do not cross, and the S never reports the presence of X.

From a consideration of the relative heights of these approach and avoidance gradients at any given level of cue strength, it is possible to interpret various thematic response patterns to a graded set of TAT-type pictures, so as to yield information about both

hypothesis strength and fear strength with respect to event *X*. However, such an interpretation is valid within the present framework only if other cues (re events *Y* and *Z*) are held constant while cues re *X* are increased through the sequence of pictures. Usually this requirement can only be approximately satisfied. Moreover, if the picture sequence is extended beyond a rather small number, it is to be expected that "theme fatigue" or "desire for new imaginative experience" will produce a shift in theme, even in nonanxious *S*s.

Within such limitations, however, the above formulation may prove useful in interpreting thematic responses to projective tests. It was used to predict the relationships reported in the present studies of imaginative behavior. It might conceivably be extended to areas of perceptual and cognitive behavior as well; for the concept of avoidance tendency in the present schema appears quite analogous to the concept of perceptual defense and to the concepts of repression and distortion in memory.

SUMMARY

The *S*s in three different studies were asked to write or tell imaginative stories about series of ambiguous pictures under two conditions. The first condition (low cues) provided no intentional suggestion as to what the content of the stories should be. The second condition (high cues), for the same *S*s, focused their attention on a particular event, which might be threatening to some of them. One of the studies presented war catastrophe as the potentially threatening event; the other two studies focused on competition with a standard of excellence. In all three studies sizable proportions of the *S*s (though in no case a majority) exhibited *decreased* tendencies to tell stories about the threatening event under high-cue, as compared with low-cue, conditions. These *S*s are called *avoiders*.

According to the proposed theoretical interpretation, avoidance results from fear of the critical event. Therefore, when avoiders do tell stories about the event, they should display symptoms of fear within those stories. But when they "get out of the threatening situation" by telling stories about some other, nonthreatening, event, these symptoms of fear should disappear.

Content analysis of the imaginative stories provided support for this interpretation. Comparison of avoiders' and nonavoiders' stories about the threatening event yielded eleven out of twenty-three instances in which the former showed significantly more evidences of fear. All the other differences, save one, were in the predicted direction. But when these two groups were compared on their stories dealing with nonthreatening events, no significant differences were found, and the directions of differences were inconsistent.

The most reliable discriminators of avoiders' and nonavoiders' stories about threatening events were: (*a*) protocol length, (*b*) degree of acceptance of the situation described in the story, (*c*) nature of activity described, and (*d*) outcome.

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MICROGENESIS AND APHASIA

HEINZ WERNER
Clark University

DURING recent years, students of human behavior have become increasingly cognizant of the fruitfulness of developmental conceptualization and methodology for integrating, within a genetic framework, psychological phenomena observed in general experimental psychology, ontogenetic psychology, and psychopathology.

In applying developmental principles to the analysis of aphasic speech,[1] this study makes two basic assumptions: First, the functions underlying abnormal behavior are in their essence not different from those underlying normal behavior. Second, any human activity such as perceiving, thinking, acting, etc., is an unfolding process, and this unfolding or "microgenesis," whether it takes seconds or hours or days, occurs in developmental sequence. In viewing speech as an unfolding event, this study suggests the feasibility of relating certain semantic aspects of aphasic language to microgenetically earlier forms of linguistic activity.

Some such relationships have been advocated during the early part of the twentieth century by several outstanding students of aphasia such as Pick (12), Woerkom (20), and Bouman and Grünbaum (1). Bouman and Grünbaum in particular, have characterized the basic change occurring in the aphasic patient as due to "an arrest at an earlier stage of development of a mental process, which normally proceeds in the direction from amorphous total reactions toward differentiated and definite forms" (1, p. 528). These authors utilized, in their interpretations of aphasia, a notion precursory to that of "microgenesis"; but it was only after they had published their studies that experimental evidence for microgenesis, particularly in perception, was forthcoming from German laboratories.[2]

The new experimental evidence (coming from microgenetic experiments of perception) has been utilized particularly by Klaus Conrad for advancing the developmental analysis of aphasia beyond the conceptualization of the aforementioned neurologists. Aphasic phenomena indicate for him "an arrest, at a 'pregestalt' stage, of the formative process that normally leads to a fully developed form, an 'end-gestalt' " (2, p. 9). Conrad bases his comparative-genetic interpretations of aphasic phenomena almost entirely on the experimental findings of Sander and his students who were mainly concerned with the unfolding of visual patterns. These students, using a variety of techniques, e.g., tachistoscopic presentation with exposure time increasing from trial to trial, inferred from their experiments that the microgenetic formation of perception goes through an orderly sequence of stages paralleling that of ontogenesis: perception is global first, in contradistinction to a later stage at which the parts become increasingly more articulated and integrated with respect to the whole. Furthermore, much of the initial perceptual quality is dynamic, "physiognomic"; feeling and perceiving are little differentiated, imagining and perceiving not clearly separated (13).

Conrad's genetic interpretation of aphasia has been criticized on the grounds that it relies mainly on experimental findings dealing with nonlinguistic, visual forms; for relating abnormal speech phenomena to levels of functioning, one needs to link it to microgenetic changes that concern the cognition of linguistic patterns rather than the perception of visual forms. Some of these relationships will be discussed in the following sections; this discussion is not offered as a definitive solution, but as a suggestion to point up the feasibility and fruitfulness of such comparison.

Spheres of Meaning at Microgenetic Levels of Language and in Aphasic Performance

In this section we shall center our discussion on a phenomenon observed probably first by Lotmar (11) in aphasic patients who have difficulty in word finding,—the expression or

[1] This paper is confined to problems of normal and abnormal "inner language forms" (linguistic semantics).

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apprehension of linguistic forms in terms of "spheres of meaning" rather than of specific concepts. The patient, unable to grasp the specific meaning of a linguistic sign, nevertheless enters the semantic sphere aroused by it and utters a name that belongs to that sphere. For example, instead of "cigar," he may read or repeat "smoke." If the assumption of the relationship between microgenesis of speech and aphasic disturbances is correct, one should be able to demonstrate spherelike forms of cognition in normals trying to decipher verbal material too difficult to grasp immediately.

An early experiment (17) consisted in the tachistoscopic presentation ($\frac{1}{50}$ sec.) of verbal material varying in complexity: single words, two-word combinations, three-word combinations, and short phrases. After each single exposure the *S* had to report everything in his experience pertaining to the stimulus. Each stimulus was repeated until the *S* was certain as to the meaning of the words. The words were in German, the mother tongue of the ten *S*s. As is known from numerous experimental studies on tachistoscopic reading, individuals differ greatly in attitude and behavior. Here, there were *S*s at one extreme, who relied in their reports entirely on the visually given. They either reported only when the words appeared to them in full visual clarity, or they constructed the visual word pattern from fragments successively seen during the trials. But there were also *S*s whose reports consistently conveyed a microgenetic unfolding of meaningful patterns. The stimuli aroused "feelings of word meanings" inner experiences of the semantic sphere of the linguistic forms, that were apparently prior to any specific articulation of the words. Among the ten *S*s of the study, two could be called extreme in regard to the behavior of the first kind, and two typical of the second kind. The other six *S*s oscillated more or less between the two kinds of behavior. Thus, most of the *S*s gave some evidence of experiencing spheres of meanings prior to the specific articulation and signification of the verbal material. With ten test items employed, the number of items that called forth "spheric" responses were, for each of ten *S*s, respectively: 10, 8, 6, 5, 3, 3, 2, 2, 0, 0.

Examination of responses that indicate spheric cognition led to the conclusion that this type of experience possesses certain characteristics less apparent with words that are quickly recognized. One such characteristic pertains to the prevalence of bodily experiences as intricate parts of cognition. Another frequent feature is the "dynamic" or "vectorial" nature of meaning spheres often described by the *S* in terms of force, direction, motion. A third characteristic pertains to the "atmospheric" or "contextual" nature of early experiences of word meanings; the *S* described the word content in terms of global impressions rather than specific circumscribed concepts.

The following comparative discussion will center successively on each of these three features of spheric cognition: First are presented examples from the tachistoscopic experiment which may serve to illustrate spheric cognition in terms of *organismic involvement*. The following is the report of a subject who read the tachistoscopically presented words "*sanfter Wind*" (gentle wind) accurately at the fifth presentation:

1. "—? *Wind*." What stood before "wind" feels like an adjective specifying nature of wind; feels like "warm" or something similar. Definitely not a word defining direction.
2. "— *ter Wind*." Know now that the word is "heavier" than "warm" . . . somehow more abstract.
3. "— *cher Wind*." Now it looks more like an adjective-of-direction.
4. "— *ter Wind*." Now again somewhat more concrete, it faces me and looks somewhat like "*weicher Wind*" (soft wind), but "*ter*" is in my way.
5. Now very clearly: "*sanfter Wind*." Not at all surprised. I had this actually before in the characteristic feel of the word and the looks of it.

This report contains two remarkable features. One is an early emergence of the general sphere of word meaning ("warm," "soft") prior to the specific word recognition. The second points to the psychophysically undifferentiated nature of this experience ("feels like warm"), suggesting the involvement of bodily organismic factors. The following report of the same *S* shows some similar features; here, two verbs: "*Ächzen Schwirren*" (groan, whir) were presented:

1. Two long forms equal in height. The last seemed to have something *vibrating*, something almost like "schwirren," "wirbeln" or the like.
2. "*ächzen*"(?) The left word rather guessed than actually seen: its first part impressed me as something depressing, distressing, torturing. Second word not grasped.

3. "*ächzen.*" The first word almost certain, still some feeling as before [see 2]. The second indefinite; nothing vibratory experienced.
4. "*ächzen schwirren.*" Both words very unclear. The impressions are about the same as in 1 and 2, however, not as precise.

The following are responses of another subject to "*blanke Waffe,*" a word combination equivalent to naked weapon or naked sword. For understanding the reactions of this subject, it should be noted that German "*blank*" also is synonymous with polished, smooth.

1. "*— Waffe.*" Unclear about the first word.
2. "*-nk-Waffe.*" Read "*nk*"; before it something from *which one slips off*, also, impression of something shining: from this I would guess "*blanke.*"
3. "*blanke Waffe.*" Yes, it's correct!

The three foregoing examples illustrate first that spherelike impressions may be present prior to the clear perception of word forms, and second that organismic-bodily factors may be important factors in this early cognition. The organismic experience may be in terms of a total bodily feeling, as in the first example, or in terms of emotional-kinesthetic effects as in the second illustration, or in terms of action-like inner gestures, as in the third.

Turning now to responses of *aphasic* patients, one finds that in many instances, aphasic cognitions emerge in form of organismic-bodily reactions which seem to be comparable to the responses of our normal subjects.

The following is a typical reading performance of one of Conrad's patients whose speech disturbance has been characterized as cortical motor aphasia.[3] Presented with "*Butter*" (German noun identical with the English), the patient immediately made the motion of spreading butter on bread. He read, "*Brot* (bread) . . . *Brot* . . . *nein* . . ." Finally: "*Butter* . . . *Butterbrot*" (bread-and-butter) (4, p. 537). Another of Conrad's patients (a case of "conduction aphasia") was asked to name the picture of a trombone (German: *posaune*). After unsuccessful attempts by the patient to articulate, the experimenter pronounced the word. The patient said "*Blo* . . . *blo* . . . *Blos trompete*" (blow trumpet) (5, p. 203). The patient's naming of pictured objects typically proceeded through verbalization of a bodily sphere of action such as that of "blowing" as in the above illustration, or of "grinding" (picture of a coffee grinder), "ironing" (picture of a flat iron), "squirting" (picture of a funnel), etc. (5, p. 207). Many clinicians have been impressed by this kind of behavior of patients with naming disturbances. Thus, Weisenburg and McBride report of a patient: "He would sometimes be able to say 'scissors' after he had wriggled two fingers back and forth as if in cutting. Or again, he would hesitate over 'pencil,' reach toward his vest pocket where he kept a pencil, and then be able to say the name" (15, p. 245). Some of Weisenburg and McBride's patients could indicate by gestures word meanings which they could not articulate verbally.

A second characteristic of spheric cognition concerns word-meaning experienced as a *dynamic-physiognomic, vectorial event.* Here, again, reactions of normal *S*s to tachistoscopic verbal material are presented first, with aphasic responses later.

The following are responses of a subject to "*heulender Lärm*" (howling noise):

1. "(*b*) . . . *nder Lärm.*" I believe first word is a *participium presentis.*
2. "*blasender* (?) *Lärm*" (blowing noise). Uncertain, not clearly seen. However, have the impression that I am, in general, on the right track. The first word is some sort of an adjectively used *participium* which qualifies the sound character of the noise. However, "*blasender*" is hardly possible; I actually read ". . . *nder*" with the first part of this word indicating *something lengthily drawn out in one direction.*
3. "*heulender Lärm.*" Quite astonished because this completely fits that previous general impression of a long drawn-out pulling.

The reactions of another *S* to the same stimulus words convey a similar microgenetically early impression of a general dynamic, vectorial quality that is prior to the distinctive word meaning: "The first pattern of letters produced for me the picture of something in sweeping motion, such as clouds of dust stirred up and driven by high winds through narrow streets."

The foregoing examples illustrate the vectorial nature of spheric cognition in the more restricted sense of directional dynamics. The characteristic termed here "dynamic" refers, however, to a much wider category of cognitive experience. It includes the whole range and variety of physiognomic word per-

[3] Because of the nature of this paper, we will present neither case histories, nor any discussion or evaluation of the diagnostic terminologies of the authors cited.

ception. For instance, in the following response to "*dürrer Ast*" (dry branch), an *S* experienced the physiognomic quality of "brittleness" before he became certain of the specific meaning of the word: "'*oster Ast*' . . . *something brittle.* It might therefore have been "*dürrer Ast,*" but "*oster*" (meaningless syllables) does not fit this."

Turning to the performance of aphasics, one finds similarly that a patient might experience the general vectorial-physiognomic character of words and aptly describe it without being able to advance toward the semantically specific and adequate form. One of Weisenburg and McBride's patients (a case of "receptive aphasia") gave the following responses on a synonym test (selection of a synonym from five words presented with the key word). The key word was "conflict": "Conflict . . . expedition . . . fight . . . flow . . . mistake . . . dismay . . . well, if you run your automobile down here and you run into a tree, it's a conflict. If you don't watch yourself it's a mistake." He chose "mistake." One notes that "conflict" is understood in its general concrete dynamics of something involving a clash without its specific conceptual meaning in terms of a collision of intentions or forces (15, p. 258).

Engerth's patient, in his endeavor to name familiar objects, also illustrates the emergence of the appropriate word from the level of general dynamic-physiognomic experience. For instance, these are his attempts to name a well-polished wooden box placed before him: "*Glitz . . . glitsch . . . schlangs . . . glatt-wie Seife . . . glatt, glatte Schachtel*" (slippery-like . . . snake . . . smooth-as-soap . . . smooth, smooth box). The patient, looking for the word "smooth," apparently developed it from the general dynamic experience of a "slippery thing" (snake, soap). The protocol is interesting also in regard to a particular aspect of dynamic experience, that of "physiognomic sound patterns," verbal expressions that convey their particular dynamics in the sound themselves. Thus, the patient first employed physiognomic sound patterns such as "*glitz*" and "*glitsch,*" which are idiosyncratic forms expressing slipperiness; even the conventional noun "*Schlange*" (snake) had become physiognomized, more slippery, so-to-speak, by being altered to "*schlangse.*" The attempt of this patient to develop the name from the vectorial experience, trying at the same time to exploit the physiognomic qualities inherent for him in the word pattern, is equally well exemplified in his naming response to the picture of an auger (German: "*Bohrer*"; note the physiognomic sound symbolism of o and r): "'*o*' it must be! *o* makes a hole . . . *lo, lor* . . . yes, *Loch* (hole), and '*errr*'; this scratches, no . . . it makes a hole in a *Brett* (*board*) . . . *Brrrelt* . . . '*Bohrer,*' it's called" (8).

Sometimes the vectorial experience in the naming does not refer so much to the object qualities as a relationship between objects. For instance, a patient of Weisenburg and McBride's sometimes misread a word "which was nevertheless in the 'sphere' of the correct one." When the word "son" was presented to him, he first read it as 'boy,' but immediately afterwards stated: "no, it isn't . . . 'boy' . . . no . . . what my mother calls me . . . (What is that?) 'Boy' . . . no, 'so . . .' the . . . no, 'son' !" (15, p. 314). One seems justified in inferring that in such instances of paraphasic performances, a sphere of meaning is conceived in which a vectorial relationship (e.g., mother—boy, etc.) stands out.

Finally, there is a third characteristic of sphere-like experience mentioned above, its "*atmospheric-contextual*" nature.

Again, illustrations taken from the tachistoscopic experiments are presented first, aphasic responses afterwards. In the following example, a phrase "*aus Gründen der Bescheidenheit*" (for reasons of modesty) was exposed.

This is the first response of one of the *S*s: "'*Gnade—Barmherzigkeit*' (grace—mercifulness). I believe I have actually seen only the '*g*' and the '*a*' of the left word. . . . The impression is that of a *piece of printed text such as one might find in a public document.*" The *S*, after having read the phrase correctly at the fifth trial, remarked on the appropriateness of his first impression, which was one of soberness or staidness of style.

A second *S* responded to the same phrase as follows: "'*aus Gründen des Beifalls*' (for reasons of approval). Uncertain about the correctness, but very sure of my general impression; *it's newspaper style*, an *intermediary phrase*, something of a *side remark.*"

These instances suggest that "atmospheric" impressions in terms of formal-stylistic properties of a sentence as a whole may microgeneti-

cally precede the specific, correct articulation of the text.

In the following responses the *S* seems to have grasped the atmospheric 'mood' before advancing to a precise reading of the verbal material; presented were: "*friedlich traurig gütig*" (peaceful, sad, kind):

(1) "—*traurig*—." Three words *all* "*heavy*," related to each other.
(2) "—*traurig—ig*—." Three adjectives . . the whole rather "*soft*" and in a "*minor key*."

Turning to aphasic speech, many verbal responses of the patients indicate a prevalence of atmospheric impressions, an experience of global qualities of a context which may or may not lead to specific formulations of words or sentences. Excellent illustrations are found in the attempts of one of Conrad's patients to repeat words or phrases (6, p. 59):

"*Zunge*" (tongue): "Something on the body, where and what exactly I do not know."
"*Die Bäume schlagen aus*" (the trees are getting new shoots): "Woods—something about woods (forest) . . ."
"*Wir singen gern ein Lied*" (We like to sing a song): "Children play . . ."
"*Eine flinke Katze kriegt die Mäuse*" (A quick cat gets its mice): "Fox and rabbit, or something; a proverb it was, I think; something to do with hunting."

Weisenburg and McBride quote performances of a patient with amnesic aphasia which are particularly illuminating, (15, p. 313). This patient sometimes employed the name he was seeking "atmospherically" in terms of a phrase without recognizing its lexical meaning. For instance, in one of his attempts to get the word "bed," he responded as follows: ". . . I'm gonna get this . . . Well, I guess I'm not . . . when you get at night . . . you go to bed . . . When you go to bed . . . that's the only place . . . 'bed'! Oh boy!"

It seems appropriate at this point to single out a particular kind of reaction which might be subsumed under the notion of atmospheric experience, the recognition of a general category to which a word or a sentence belongs prior to the grasp of its specific meaning.

Under conditions of tachistoscopic stimulation, normal *S*s (17) at an early microgenetic stage recognized sometimes the grammatical category to which the word belonged before recognizing the word itself. Responses were given such as: "Believe this is *a verb in its indicative form*," or "*feels like an adjective.*" In the following are given successive reactions of a subject to "*aus Gründen der Bescheidenheit*" (for reasons of modesty):

1. "Long sentence *somehow incomplete*; or rather, a comprehensive sentence-part (clause)."
2. "I believe now that toward the end, there was *something substantive-like. Something belonging to an abstract sphere.*"
3. "Last word an *abstract*; long, possibly four-syllable word."

Similarly, an aphasic may, in his naming attempts, apprehend the general, categorical nature of a word or a sentence without grasping its specific content. This is illustrated by the previously cited remark of a patient trying to repeat the proverb, "a quick cat gets its mice": "a proverb it was, I think." Another patient, during his attempts to name the color of an object, enumerated various colors before hitting on the correct name, showing by this behavior that he apparently was aware of the categorical sphere of colors without being able at first to enunciate the specific color name. Still another of Conrad's patients showed a similar behavior in his attempts to read color names. (3, p. 405; 4, p. 515).

ABNORMAL VS. NORMAL MICROGENESIS: VERBAL PARAPHASIA

Normal *S*s' responses seem to warrant a primary distinction between two different ways by which the recognition of words was achieved. One kind of performance apparently consisted in direct responses to visual cues without involvement of spheric experience; the other kind of recognition seemed to involve spheric experiences which entered microgenetic word-formation in various ways. For instance, at a given trial, visual stimuli evoked in an *S* a "feel" of the meaning of the word which he could describe quite well but could not develop further toward articulating the particular verbal symbol. At other times, *S*s advanced beyond such impressions and formulated verbal concepts semantically consistent with the preconceived sphere of meaning. But even at this point considerable variability in regard to the kind of verbal formulation existed. In some instances, an *S* would indicate the meaning of the word in rather generalized terms ("this looks like an abstract noun," "a proverb," etc.), waiting for further more definite clues before

formulating specific words. In other instances, an *S* more or less disregarded the visual cues and in successive trials developed the word predominantly out of his spheric cognition. The misreading (e.g., "soft" for "gentle") occurring in this process resembled the paraphasic performance of speech-disturbed persons.

If one considers the microgenetic process in its completeness, however, the usual reading performance of all these normal *S*s appeared to consist in a mutual steering of spheric experience and visual cues till, after several corrective trials, the words were accurately perceived. As to paraphasic responses, it is suggested that they come about through a relative lack in the mutual steering of sphere-experience and of the visual, auditory, or kinesthetic cues. It appears as if the paraphasic words emerge in a process of the "self-propelling" of spheric experience into verbal articulation. This interpretation is in general agreement with the views held by Lotmar (11), Stengel (14), Goldstein (9), and Conrad (2). Only the last, however, has linked aphasic phenomena specifically to microgenesis.

It is sometimes possible to conjecture which of the spheric characteristics previously discussed might have been most potent in developing the particular "derailed" verbal response. For instance, the following illustrations suggest emergence from a sphere dominated by bodily actions: A patient unable to say "scissors" stated, "Cut things with it . . . strings and things like that," and then gave the name of the object as "stringer" (15, p. 243). An alectic person responded to the printed word "*Erde*" (earth) as follows: "something . . . (made circular movements with one hand) like a ball" (3, p. 406). From a general vectorial quality of the sphere seemed to have emerged paraphasic statements such as: "He was to *sail* by train to the South"; "he *spoke* the violin" (15, p. 253; 14, p. 266). Atmospheric-contextual impressions possibly are a dominant factor in the responses of an amnesic aphasic: asked to repeat a given word, he said, "family" for "children" and "heaven" for "God" (9, pp. 244, 280). Again, in alectic patients, paraphasic utterings emerging from categorical spheres (color, fruit, country), such as misreading "red" for "green," "peach" for "apple," or "Italy" for "England" are not infrequent (3, p. 405). A singularly illuminating example of paraphasic derailment is the response of a patient of Conrad's who was asked to give a concept subordinate to "preying animal." He said, "zebra." The inquiry revealed that he had thought vaguely of "tiger" and somehow associated "striped animal forms" (7, p. 171). Thus, it is reasonable to infer that the derailed development started from a spheric experience of "tigerness" in which the physiognomic quality of "stripiness" had become dominant.

MICROGENESIS AND LEVELS OF RECOVERY

Recovery, as Goldstein (19), Wepman (16), and others have recently emphasized, proceeds in distinct developmental steps. Observations in therapeutic situations appear to assert the principles that functioning at higher levels cannot emerge without proper functioning at lower levels and that development remains arrested at a lower level if higher level functioning cannot be instigated.

In accord with this principle, one of Wepman's patients, initially unable to name objects at all, reached the naming stage only within a concrete context of action. The first names enunciated by one patient were those of objects which she handled concomitantly with her utterings, such as "fork," "spoon," "knife." In another patient, the context which brought forth the first name had to be even of greater immediacy. This patient, although presented by the therapist over and over again with names of everyday objects, including "ladder," responded for the first time only when a small ladder broke. He then said "ladder," excitedly pointing to the wreckage (16, p. 157).

Even in regard to lesser impairments of speech, therapy frequently succeeds when the sphere of meaning is aroused through verbal stimuli that refer to the particular context and sphere. If, for instance, according to A. Jellinek, a patient cannot find the word for "mountain," one may succeed by evoking the particular sphere of meaning "conveying to him the physiognomic impression of something rising slowly, something pressing heavily upwards, etc." (10, p. 223). Conrad also has demonstrated by numerous examples the importance of spherical-contextual experiences for the re-education of the aphasic For instance, one patient of Conrad's, misreading "hat" for "mouth" responded correctly when

"nose" was placed beside "mouth." The following attempts of the same patient to read the word "*Tante*" (aunt) illustrate the formation of names that emerge from a categorical context. After several naming responses obviously based on similarity of letter groups ("*Ente*" = duck, etc.), the patient's face suddenly lit up; he remarked that now he was sure what it meant: Therapist: "Is it something to eat?" *S*: "No." Therapist: "An animal?" *S*: "No." Therapist: "An object?" *S*: "No." Therapist: "A human?" *S*: "Yes, yes . . . ," whereupon he immediately enunciated the right word ("*Tante*"), (4, p. 535).

The latter example demonstrates the occurrence of developmental steps of word finding which appear to be related to stages found in microgenetic experiments with normals. The patient started with the use of letter combinations as cues for the guessing of the word. There followed a stage where, according to the patient's report, the semantic sphere emerged without his being able to advance toward verbalization. It seems that for the correct reading of this particular word a further step, verbalization of the meaning sphere, was required. This step could not be reached by the patient himself, but as soon as the general categorical sphere was presented to him by the therapist, the correct word emerged.

It therefore appears that whereas paraphasic performance emerges through microgenetic derailment, re-educational guidance toward healthy language performance seems to be consistent with developmental stages observable under normal conditions of microgenesis. It is hoped that these and other suggestions in this paper will stimulate future studies which, by means of more refined and vigorous methods, may clarify further the here proposed relationship between normal and aphasic speech.

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PERCEPTUAL RIGIDITY AND CLOSURE AS FUNCTIONS OF ANXIETY

J. WELDON MOFFITT AND ROSS STAGNER
Brigham Young University *University of Illinois*

RESEARCH in perception has, in recent years, shifted from a focus on the properties of the stimulus and psychophysical relationships (or the development of *Gestalten*) to a concern with the interaction of dynamic states with the perceptual process. A long series of experiments, beginning with Sanford (12), has provided empirical foundation for the notion that variations in drive intensity are associated with variations in the perception of drive-related objects. A quasi-mathematical model for the prediction of such effects has recently been prepared by Stagner and Solley (16). Another line of investigation has been that of the impact of "personality" variables as dynamic influences on speed of perception of relevant stimuli, e.g., Postman, Bruner, and McGinnies (11) and their numerous successors. Still a third has been that of irrelevant drive-states, such as anxiety, and their impact upon such perceptual phenomena as closure, e.g., Korchin and Basowitz (8).

Anxiety as a perceptual determinant presents an interesting problem in view of its relevance to certain hypotheses derived from Hull's learning theory (see, for example, 14). In the investigations set up for this purpose, anxiety has occasionally been used in a "personality" sense (manifest anxiety as measured by MMPI questions) and also in a situational sense (anxiety induced by threatening instructions). Our study proposes to apply both of these to a study of perceptual phenomena, partly to test certain predictions from a homeostatic approach to perception (15) and partly to ascertain whether these two kinds of "anxiety" do in fact give parallel results or have any significant interaction.

The detailed rationale for selection of perceptual tests and the prediction of results is presented in Moffitt (9). The tests employed were: brightness contrast (Klein, 7): McGill Closure Test presenting incomplete Gestalt figures (hereafter called the articulation test) developed by Mooney (10); a closure test derived by showing a complete figure (square with X inscribed) and then presenting tachistoscopically the complete figure randomly interspersed with various incomplete modifications; a "tolerance of ambiguity" or rigidity test (cf. 3) using two series of changing pictures; and a "perceptual stability" test based on the rapidity with which *S* adapted to an Ames distorted-room situation which contained some cues conflicting with the complete rectangular perception.

Specific hypotheses were as follows: anxiety (manifest or threat-induced) increases perceptual sharpening (contrast effect in the brightness test); anxiety reduces accuracy of articulation of incomplete figures; anxiety increases the frequency of closure responses; anxiety increases perceptual rigidity (holding on to a previous percept when the stimulus is changing to give cues for another); and anxiety increases the speed of establishing a stable configuration (accepting the distorted room as rectangular).

METHOD

The *Ss* were chosen from classes in introductory psychology, which had taken the Grice Revision (5) of the Taylor Scale of Manifest Anxiety. Those *Ss* with a lie score of 6 or more were eliminated; from the remainder, 40 *Ss* scoring above 26, and 40 scoring 7 or below (each group equally divided as to sex) were invited to participate. The *Ss* were randomly assigned to threatening or nonthreatening instruction groups, so that the design was a $2 \times 2 \times 2$ (manifest anxiety by threat by sex) factorial.[1]

Threatening instructions involved the suggestion that *S* might have a neurotic personality and that these tests were designed to reveal this fact. Spontaneous comments and postexperiment interviews confirm that anxiety was aroused. (Reassurance was given at the end of the session.) Nonthreatening instructions emphasized test standardization and lack of interest in individual scores.

RESULTS

Results were analyzed by both parametric and nonparametric methods. Since the significance levels were almost identical throughout, we shall refer primarily to the parametric

[1] Complete descriptions of the testing procedure, results by individual *Ss*, and detailed statistical tables can be obtained in reference (9) from University Microfilms, Ann Arbor, Mich.

TABLE 1

MEANS FOR ANXIETY AND THREAT GROUPS ON PERCEPTUAL MEASURES

Measure*	Anxious		Nonanxious		p
	Threat	Non-threat	Threat	Non-threat	
Articulation	9.90	10.85	12.70	9.05	ns
Brightness	15.70	14.20	14.95	15.40	ns
Closure	23.60	16.45	18.95	15.35	Threat .01
					Threat .05 × sex
Rigidity	13.22	12.39	13.22	11.33	Threat .05
Stability (descending)	25.55	20.45	21.60	18.80	Threat .01 Manifest anxiety .05
Stability (ascending)	21.80	17.55	18.50	15.85	Threat .01 Manifest anxiety .05

* Scoring: articulation—number of pictures failed by *S*; brightness—amount of overestimation of contrast (judgments lighter or darker than "true" value); closure—number of lines added in drawing test figures; rigidity—number of cards *S* accepts as showing the old percept before switching to the new one which is emerging; and stability—relative overestimation of the card in the right-hand rear window in the Ames trapezoidal room.

tests employed, which permit computation of interaction effects. A summary is given in Table 1.

The hypotheses with regard to both brightness and articulation were rejected. Neither threat-induced nor manifest anxiety gave significant differences in sharpness of brightness contrast nor in accuracy of articulation.[2]

For tachistoscopic closure (number of lines added to the incomplete figure) the effect of threat-induced anxiety was significant, but that for manifest anxiety was not, nor was the interaction of these two. The sex-threat interaction was significant. Maximum closure was shown by anxious females under threatening instructions, minimum by nonanxious females under nonthreatening conditions.

Rigidity (clinging to one interpretation of the ambiguous figure while it is changing to another) was significantly increased by threat. There were no significant interactions.

Stability (quickly establishing a rectangular perception of the Ames trapezoidal room) was measured by having two cards exposed in the rear windows of the distorted room. The *S* set a variable rectangle of light with a Clason projector to match the right-hand card, a fixed rectangle representing the left-hand card. Two measures were taken, ascending to a match and descending to a match. On both series threatened *S*s showed greater stability or acceptance of the "rectangular" perception (.01 level); *S*s higher on manifest anxiety also showed greater stability (.05 level). There were no significant interactions.

[2] Kamenetzky (6) has pointed out that results in this case might well have been different had we tested for rigidity of clinging to the first articulation developed. This would be more closely in conformity with a deduction from Hull's drive concept, which was not explicitly involved in the formulation of the present study. It fits, of course, our finding on the rigidity (ambiguous figures) test.

DISCUSSION

Our results indicate clearly that threat-induced anxiety modifies the perceptual process by enhancing constancy. Previously established percepts (the original form in the closure series, the original picture in the changing-figures series, and the rectangular form established by past experience in the Ames series) are adhered to more tenaciously under threatening instructions. The brightness-contrast effect, which depends mainly upon structural stimulus cues, was not significantly modified, nor was the articulation score. Although the articulation phenomenon might be said to involve constancy, there was nothing in the experimental procedure to test adherence to an hypothesis, once established. When Smock (13) allowed his *S*s to develop a percept and tested them for resistance to change, his threatened *S*s also showed the phenomenon of clinging to an incorrect hypothesis for a longer period, as did ours in the rigidity series.

It has been suggested by Stagner and Solley (16) that *S*, at any given point in time, is "scanning" both interoceptive and exteroceptive sources of stimulation. Cues so received give rise to completed percepts, based on conditional probabilities from past experience. Such conditional probabilities may be widely separated and clearly discriminable, in the case of well-formed and clearly structured stimulus configurations, or they may be close together and poorly discriminable (ambiguous configurations). In the latter case it would be held that more complete sampling of the exteroceptive cues is necessary for precise and realistic discriminations.

If now we introduce a threatening element into the situation, *S* will scan relatively more from interoceptive cues and less from extero-

ceptive stimulus sources. Anxiety is likely to set off visceral tensions, sending in a flow of afferent impulses which interfere with the detailed sampling of the external stimulus material. In the three tests on which we found significant changes related to threat, the task called for detailed sampling if *S* were going to detect the missing lines (closure), the changing object-character in the ambiguous figures (rigidity) or the nonrectangular character of the Ames room (stability). It may be noted that Korchin and Basowitz (8) found that paratroopers showed more perceptual closure in the morning before a scheduled jump than in the evening when this stress had been removed.[3] Our interpretation of all three of these differences, as well as that reported by Korchin and Basowitz, makes use of the scanning hypothesis. Specifically, if *S* samples a broken circle or other incomplete figure hastily, it is more likely that he will fail to sample the "gap" and consequently will perceive the figure as complete, when he is operating under stress conditions. The influx of visceral afferents interferes with adequate sampling of the visual field.

From the homeostatic point of view, anxiety can be conceived as one variety of energy mobilization to restore equilibrium (15). However, an important distinction must be made between perceptual effects upon drive-relevant and drive-irrelevant objects. As Gilchrist and Nesberg (4) have shown, drive-relevant objects are overestimated (as to luminance, in their procedure) whereas irrelevant objects are not. In terms of a scanning hypothesis, we can suggest that drive-relevant cues in the environment are overscanned, irrelevant cues underscanned. Thus, in a situation demanding size estimation (1) or luminance estimation (4), relevant objects will be overestimated. Constancy presumably operates to keep the irrelevant objects at normal size and brightness. Since our method has not made use of any drive-relevant stimulus sources, such a comparison is not possible within our data. However, it is clear that object-constancy depends upon the assumption by *S* that cues which in the past have signaled a complete figure still do so. An overestimation of constancy results from reliance upon conditional probabilities established in the past, as opposed to detailed examination of the immediate stimulus object. Our data indicate that threat-induced anxiety fosters this exaggeration. The scanning hypothesis appears to offer a plausible interpretation of both sets of data, those deriving from estimation of object-attributes and those deriving from constancy measures.

Manifest vs. threat-induced anxiety. One aim of this study was to test the assumption that manifest and threat-induced anxiety were functionally identical. We are impelled to question this assumption, although manifest anxiety did relate significantly to the stability test and showed trends in the appropriate direction on closure and rigidity. Certainly, at the least, we must conclude that manifest anxiety leads to differences which are far smaller than those derived from threat-induced anxiety.

The difficulty may arise from the fact that studies involving only manifest anxiety as an explicit variable (e.g., 14) have in fact been arousing threat anxiety in the anxious group. It is implicit in these studies that an *S* who scores high on manifest anxiety is one who responds to almost any situation as a threat. Hence, with uniform instructions, it may be that anxious subjects are threatened, while nonanxious *S*s feel no threat. Then, in our study, the anxious *S* may already have been at such a high level of arousal that our threatening instructions could have relatively little further effect; on the nonanxious group, the threat instructions may have been markedly effective. If this were the case, however, significant interactions should have been obtained between threat and anxiety.

Another alternative is that some of our high-anxiety cases have, over time, learned methods of dealing with their anxieties, whereas others have not. To test this hypothesis it would be necessary to do a "personality-centered" study in which objective criteria of such differences would be established. Such criteria could probably be derived from clinical procedures.

When our operations are compared with those used in the learning studies (e.g., 14), it

[3] Korchin and Basowitz found that *S*s high in hippuric acid production (a biochemical indicator of anxiety) increased in proportion of closure responses more than *S*s low on this acid measure. This suggests a visceral activation under stress which seems compatible with the interpretation proposed above.

is apparent that perceptual functions are relatively simpler, and somewhat closer to complete determination by the physical environment, than even a task like eyelid conditioning. In other words, a task which involves response learning may well involve more of the entire organism, and so intra-organismic variables such as anxiety may have more significant effects, than in the case of perception.[4] We have nevertheless demonstrated for threat-induced anxiety a significant effect on one category of perceptual tasks, those involving constancy.

Sex and anxiety. It is well known that there are significant sex differences on the Taylor scale, which conform to a cultural stereotype of women as more anxious than men. It may thus be of some interest to note that only on the closure test did we find a significant interaction between sex and either of the anxiety variables. On this test the threat-sex interaction was significant at the .05 level, women responding much more to the threatening instructions than did the men. Contrary to our expectations, we did not find any significant interactions of sex with manifest anxiety.[5]

SUMMARY

1. Threat-induced anxiety has been shown to modify perceptual processes significantly in the case of tachistoscopic closure, rigidity and stability as defined. These three functions involve maintaining constancy of a previously established percept in the face of incompatible cues from the environment.

2. Manifest anxiety was significantly related only to the stability test. However, in the closure and rigidity series, manifest anxiety yielded differences in the predicted direction.

3. On the articulation and brightness tests, neither threat-induced nor manifest anxiety resulted in significant differences.

4. An interpretation of the tendency to exaggerate object-constancy under threatening conditions was offered in terms of a scanning process.

5. Some speculations were presented with regard to the difference between manifest and threat-induced anxiety.

[4] It should also be noted that in some studies, manifest anxiety has been found to have a significant negative correlation with intelligence. This may have contributed to some of the findings of inefficient learning of complex materials by *Ss* high on manifest anxiety.

[5] It is important to note that the same cutting score was used in selecting both male and female *Ss* on the Taylor scale. Whether this means real "equality" on manifest anxiety is debatable, since there is cultural pressure on males to deny some of these symptoms. However, if any inequality existed, it obviously did not operate to affect any of our perceptual measures.

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PARENT-CHILD RELATIONS AND FATHER IDENTIFICATION AMONG ADOLESCENT BOYS

DONALD E. PAYNE AND PAUL H. MUSSEN
The Ohio State University

Workers in the field of child development, personality theory, and clinical psychology agree that identification is a fundamental concept. While there are some differences in the way the term is used, it generally implies that "a child gives its emotional allegiance to one of its parents and attempts to duplicate in its own life the ideals, attitudes, and behavior of the parent with whom it is identifying" (10, p. 163).

According to several theorists, children of both sexes initially identify with their mothers since they are most likely to develop emotional attachments to her and to find participation in, and imitation of, her activities rewarding (4, 6). Later on, the father is likely to become the chief source of rewards for the male child. He associates more with his son and allows the boy to participate in more activities with him. At the same time, society demands that the boy adopt the proper sex role. For these reasons, the boy shifts from identification with his mother to identification with his father (4, 6).

Sears, Pintler, and Sears (7) have shown that if the father is absent from the home his preschool-age son is likely to be delayed in acquiring sex-appropriate behavior patterns. But, according to the theory, mere presence of the like-sexed parent in the home is not enough to promote identification with him. It has also been hypothesized that the process is influenced by "the degree of affection accorded to the child by the person with whom identification is attempted" and "the extent to which the child's needs are gratified by the person with whom identification is attempted" (10, p. 166).

Although there are many case histories which seem to lend support to these hypotheses, there are no published data, based on normal subjects, which test them directly. Sears (6) has presented some indirect evidence, however, which is highly relevant. She found that the five-year-old sons of warm, affectionate fathers tend to play the father role in doll-play activities more frequently than boys whose fathers are relatively cold. Insofar as extent of playing this role may be an index of the degree of identification with the father, it may be inferred that warm fathers are likely to foster strong father identification in their sons.

Clinical observation indicates that boys who prefer their mother (i.e., see her as more rewarding and more affectionate) throughout childhood are not likely to shift their identifications to their father. In such cases they are apt to adopt sex-inappropriate behavior patterns or to become conflicted about their sex roles (8).

Direct rewards for imitation of the father's behavior also play an important role in the adoption of masculine behavior patterns. If the child is frequently and consistently rewarded for "acting like daddy" he develops a generalized tendency to imitate his father. As Mowrer (4) has pointed out, the extent to which the child is rewarded for sex-appropriate behavior depends not only on the actions of the like-sexed parent but also on generally harmonious interparental relationships.

Most clinicians and theorists agree that the child who achieves sex-appropriate identification is more likely to become well adjusted subsequently than the child who fails to achieve such identification. Several systematic studies also present evidence relevant to this notion. In one study of adolescent boys, low perceived father identification (measured in terms of the similarity between the subject's own MMPI responses and those he thought his father would give) was found to be related to more abnormal MMPI profiles (9). In another study, boys who perceived themselves as being similar to their fathers with respect to Strong Vocational Interest Inventory patterns manifested fewer conflicts in their Blacky Test stories (1). However, as Child (2) has pointed out, both of these studies may be criticized on the grounds that the techniques used may be measuring only projection, i.e.

the child's projected, rather than actual, resemblance between himself and his father.

The present study which made use of actual father-son similarities as a measure of identification was designed to test four specific hypotheses derived from the theoretical considerations discussed above: I. The degree to which boys identify with their fathers is related to the degree to which they perceive him as rewarding, i.e. the extent of his kindness, helpfulness, warmth. II. The degree of father identification is related to the differential reward values of the two parents, or, more specifically, to the extent to which the father is seen as relatively *more* rewarding than the mother. III. The degree of father identification in boys is related to the extent to which they perceive their families (parents as a unit) as rewarding. IV. Among boys, a high degree of father identification is conducive to adequate social and emotional adjustment.

METHOD

Measures of identification. Initially, 182 boys, juniors and seniors in a public high school in a medium-sized city, completed questionnaires consisting of 50 items, each of which was to be checked as true or false. The items were selected from three scales of the California Psychological Inventory (3): 18 from the Tolerance Scale (e.g., "Disobedience to any government is never justified"); 17 from the Social Participation Scale (e.g., "I am a good mixer"); and 15 from the Masculinity-Femininity Scale (e.g., "I prefer a shower to a bath tub").

Copies of the same questionnaire were sent to the boys' mothers and fathers who were requested to complete them independently and return them by mail. In 72 cases, both parents complied with the request.

Thus, a sample of 72 boys was available whose attitudes, orientations, and preferences could be compared with those of their mothers and fathers. The number of father-son and of mother-son agreements (identical answers) was counted. Each boy's father-identification score consisted of the number of father-son agreements *minus* the number of mother-son agreements. This difference score seemed more appropriate as a measure of identification than the number of father-son agreements alone because it reflected the differential adoption of paternal rather than maternal or general familial attitudes. However, this score was highly correlated with the number of father-son identical responses ($r = +.74$). As would be anticipated, most boys (58) had positive scores; that is, they had adopted more of their fathers' than of their mothers' attitudes.

The 20 boys most highly identified with their fathers (father-identification scores ranging from +6 to +14 with a mean of +7.7) and the 20 who were least highly identified (scores of +1 to −6 with a mean of −1.9) were selected for further study. The two groups were matched in age (mean age for both groups, 17.0 years), grade placement (eight seniors and twelve juniors in each group), and approximate socioeconomic status.

Measures of parent-child relations. Each of the 40 boys completed five projective incomplete stories dealing with parent-son relationships. For example, in one story, "A boy wants to use the family car for a date on Friday evening. He knows that neither of his parents plans to use the car. . . . Which of his parents would he ask for the car, and what would happen then?" It was assumed that the boy's responses revealed his perceptions of his own experiences with his parents.

In order to test the hypotheses, the nature of the boy's attachments to his father, mother, and parents (as a unit) were assessed objectively by scoring the incomplete stories in two ways. First the stories were examined for the presence of concrete rewards (gifts, praise, demonstrations of affection, permission to use the car) from the mother, father, or parents (undifferentiated). The total number of stories in which the father was seen as the source of a reward constituted the boy's father-reward (FR) score; the number in which the mother was seen as the source was the mother-reward (MR). A family-reward score (FamR) was derived from the sum of the stories involving rewards by parents (mentioned without designating mother or father specifically) plus the MR and FR scores.

It is, of course, quite possible that a child may become attached to, and dependent upon, a parent who does not give him many concrete rewards, but who maintains a generally satisfying relationship with him. For this reason, the stories were also scored in another way. Two judges rated each story independently with respect to presence or absence of positive relationships with mother, father, or parents (undifferentiated, taken as a unit). Presumably the judges used clinical criteria such as parental understanding, mutual respect, and affection in making their judgments.

Three scores, closely paralleling the three scores based on the first method of scoring, were derived from these ratings of the psychological soundness of relationships. These were: PRF, the number of stories in which there was evidence of a positive father-son relationship; PRM, the number of stories reflecting positive mother-son relationships; and PRFam, the sum of PRF, PRM and the number of stories involving positive relationships with parents (father and mother not referred to separately).

Measures of adjustment. Each subject's home-room teacher rated him on nine traits presumably related to social and emotional adjustment. These were: calmness, friendliness, sensitivity, popularity, masculinity, persistence, tolerance, assertiveness, and emotional adjustment.

The traits were rated on five-point linear scales having descriptive comments at each of the points. Scores on these traits, derived from the ratings, ranged from one to five, a score of one indicating the lowest degree of the trait, five the highest. Since only one teacher rated each boy, it was impossible to check the reliability of these ratings.

TABLE 1
CORRELATIONS BETWEEN FAMILY VARIABLES AND FATHER-IDENTIFICATION SCORES

Variable	tet-r
FR	.30*
PRF	.37**
FR minus MR	.31*
PRF minus PRM	.15
FamR	.37**
PRFam	.39**

* $p = .05$.
** $p = .02$.

RESULTS AND DISCUSSION

The first three hypotheses dealt with the influence of the boy's perceptions of the reward values of members of his family on the strength of his identification with his father. Translated into the operations of the present study, Hypothesis I stated that the degree of father identification is positively related to the number of perceptions of the father as a gratifying, rewarding individual. To test this, father-identification score (high or low) was correlated with high and low scores (above or below the median for the total group of 40 subjects) on FR and PRF.[1] Hypothesis II was tested by correlating father-identification status with high and low (above or below the median for the entire group) scores on the measures of the extent to which the father was seen as the predominant source of reward (*more* rewarding or gratifying than the mother; FR—MR; PRF—PRM). In order to test the third hypothesis, father-identification status was correlated with high or low status (above or below median for the entire group) with respect to the two measures of the perceived reward value of the family as a whole (FamR, PRFam).

The findings, which generally support the hypotheses, are summarized in Table 1.

The significant positive correlations between father-identification scores and the two measures of the reward value of the father are clearly consistent with Hypothesis I. As had been predicted, boys are more likely to identify with fathers whom they perceive as rewarding, gratifying, understanding, and warm than with fathers who are not perceived in these ways. If the son's perceptions are in fact determined by the father's behavior toward him, it may be inferred that fathers who are the source of many rewards and who have established sound psychological relationships with their sons facilitate the boys' identifications with them.

The results only partially support the second hypothesis. Most of the boys (87 per cent) saw their fathers as more rewarding than their mothers, i.e., had positive FR minus MR and PRF minus PRM scores. According to the second hypothesis, the perceived differential between the father's and mother's reward values would be greater for highly father-identified than for less highly father-identified boys. Only one of the two correlations relevant to the hypothesis was significant. Boys who are strongly identified with their fathers see the mother-father differential with respect to concrete rewards as a relatively great one. Less highly identified boys tend to regard the difference as smaller. The hypothesized relationship does not hold with regard to the differential in general psychological soundness of relationships, however.

The significant correlations between father-identification scores and the two total family variables lend support to the third hypothesis. Compared with boys who have relatively weak father identifications, those who are highly identified with their fathers obtain greater concrete reward scores, that is, regard their families as generally more rewarding in concrete ways. Moreover, according to their stories, they have stronger feelings than their less highly father-identified peers that they have established close, warm relationships with their parents.[2]

It seems quite likely that boys who perceive their parents as important sources of reward and express a great deal of satisfaction about their relationships with them are from gener-

[1] All relationships between familial variables and degree of father identification were measured by means of tetrachoric correlations for extreme groups, according to the method described by Peters and Van Voorhis (5, p. 375).

[2] It should be noted that this relationship cannot be attributed only to the correlation between identification and father rewards scores (FR), since FR and FamR were not highly correlated ($r_{tet} = +.23$, which is not significant). Thus, although rewards from the father contribute to the total family rewards, another factor (such as general reward value of the family) must be introduced to account for the significant correlation between FamR and identification.

ally harmonious families. This is the type of family in which, as Mowrer (4) suggests, both the mother and father reward the boy's imitation of his father. Our data clearly support the hypothesis that boys who feel comfortable in their relationships with their parents adopt more of their father's behavior and attitudes than boys who experience less favorable parent-child relationships.

While these relationships between familial variables and strength of identification clearly support the first three hypotheses, the data do not enable us to specify antecedents and consequents. That is, the findings may be interpreted to mean that favorable perceptions of the father and the family unit are the antecedents of strong father identification. On the other hand, it is possible that such identification itself is antecedent, leading to favorable, but perhaps distorted, perceptions of other members of the family. The former interpretation seems the more plausible to us, since it is consistent with much of the theory regarding the determinants of identification, with clinical observation, and with findings such as those reported by Sears (6). Independent, nonprojective measures of the reward values of various family members, correlated with indices of identification, would help to clarify the problem.

The fourth hypothesis, dealing with the relationship between degree of father identification and social and emotional adjustment, was tested by correlating identification status with the teachers' ratings on each of the nine personality characteristics. Tetrachoric correlations were again used since the psychological trait ratings had been dichotomized into high and low categories (above and below median for all 40 subjects).

Only two of the nine personality characteristics, calmness and friendliness, were significantly correlated with identification status (r_{tet} = +.44 and +.39, respectively). The other seven correlations did not differ significantly from zero. While strength of identification may be more highly correlated with other more valid and more reliable measures of adjustment, the present findings are at least partially supportive of the hypothesis. If higher ratings on these characteristics are indicative of better social and emotional adjustment, it may be inferred that substantial father identification is conducive to more adequate personal adjustment.

Some other findings, not directly related to the hypotheses, are also of interest. It will be recalled that the questionnaires to which the boys, their mothers, and their fathers responded contained 15 masculinity-femininity items from which masculinity scores could be derived. The boys' masculinity scores were highly correlated with father-identification scores (r_{tet} = +.60), indicating that boys who are closely identified with their fathers tend to have more characteristically masculine attitudes than their peers who are less highly identified with their fathers. In spite of this they apparently do not appear to be more masculine in their everyday behavior, for ratings of masculinity were not significantly correlated with father-identification scores.

Surprisingly, the fathers of the highly identified boys did not have significantly higher masculinity scores than the fathers of the less strongly father-identified boys. The correlation between boys' identification scores and fathers' masculinity scores (r_{tet} = .00) shows that boys may identify with their fathers and adopt many of their attitudes if these fathers are seen as warm, understanding, and rewarding, regardless of whether or not they have highly masculine attitudes. Since the highly identified boys are generally more masculine in attitudes it may be inferred that good identification with the father is basic to learning these attitudes. Perhaps the boy who has been rewarded for imitating his father's behavior begins, through generalization, to emulate behavior of other men also. The attitudes he holds when he is an adolescent are adopted partially from the father but also from other, often more masculine, models.

On the other hand, mothers' masculinity scores were significantly negatively correlated with their sons' identification scores (r_{tet} = −.38). The more masculine the mother, the less strongly the boy tends to identify with his father. This finding is entirely consistent with what would be predicted on the basis of learning-theory hypotheses concerning identification. The more masculine woman tends to be more dominant in the home and may be perceived as the principal source of reward and gratification for her son as well as her

daughter. When this is the case, the male child remains attached to her and dependent upon her and is consequently less able to establish a close relationship with his father. Hence, he is not as likely to identify with his father and to adopt his behavior and attitudes.

SUMMARY

Fifty items from the California Psychological Inventory were administered to junior and senior high school boys and their parents. Extent of identification with the father was measured by subtracting the number of items to which mother and son had responded identically from the number of items to which father and son had responded identically. The 20 boys with highest father-identification scores and the 20 boys with lowest father-identification scores were then given an incomplete-stories test. Judges rated each story for the presence of concrete rewards and psychologically sound relationships with the parents (considered individually and as a unit).

Three hypotheses dealing with antecedents of high and low father identification were tested. Analysis of the data revealed a significant relationship between high father identification and perception of the father as a highly rewarding, affectionate person (Hypothesis I). There was some evidence that the differential between perceived reward value of the father and mother (in favor of the father) would be greater for highly father-identified boys than for those less strongly father identified (Hypothesis II). Strong identification with the father was associated with perceptions of relationships with parents (considered together) as highly rewarding and warm (Hypothesis III).

For these subjects, degree of father identification was highly correlated with masculinity of attitudes. Relatively masculine mothers tended to inhibit strong father identification in their sons. According to teachers' ratings of the subjects on nine personality characteristics, boys who were strongly father-identified were significantly more calm and friendly than their less highly identified peers.

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PERCEPTUAL ACCURACY IN SCHIZOPHRENIA, DEPRESSION, AND NEUROSIS, AND EFFECTS OF AMYTAL[1]

BERTRAM D. COHEN

Iowa City VA Hospital and State University of Iowa

RITA SENF AND PAUL E. HUSTON

College of Medicine, State University of Iowa

THE low Rorschach $F+\%$ found in schizophrenia is often considered an indication of a disturbance in perception. Beck, for example, concluded that "the schizophrenic excels in his tendency to misconstrue the world that is presented, giving it a form and outline which the healthier do not see. . . ." (2, p. 101). It seems possible, however, that the degree of perceptual disturbance may vary with the nature of the task. Comparison of performance on different types of perceptual tests should provide further information concerning schizophrenic perceptual impairment.

This paper reports the results of two such tests, Hands and Street Gestalt Completion, adapted from tests developed by Thurstone (14, 15), together with selected Rorschach scores. Two schizophrenic groups, early and chronic, were studied; and a depressive and a neurotic group, intended as psychotic and nonpsychotic controls. Each test was administered without and with drugs, intravenous sodium amytal and amphetamine sulfate. When given these drugs, some schizophrenic patients appear more responsive and in better contact with their environment (5).

METHOD

Subjects

The patients included 24 chronic schizophrenics (CS), 22 early schizophrenics (ES), 21 manic-depressives, depressive type (Dp), and 21 neurotics (Nt). The mean ages in years for the 4 groups were: CS 39, ES 26, Dp 37, Nt 30. The mean durations of illness were: CS 12 years, ES 1 year, Dp 9 months, Nt 6 years. The average educational level was approximately 12 years in all groups. Other characteristics of the patients are described in (4).

Tests

Hands. This task, in which hands are pictured in various positions, was considered to involve "facility in spatial and visual imagery" (14, p. 80). The subjects (*Ss*) were given a sample card with 12 pictures and were told to identify each hand as right or left, without turning the card. Any errors were corrected; then the following instructions were given: "On this card are more pictures of hands. Do them just as you did the samples, starting at the top and going across each row. Work as quickly as you can without making any mistakes. Point to each hand as you answer. Be sure to say out loud either right or left for each picture." Forms A and B, nondrug and drug, each contained 30 pictures arranged in 5 rows. From the pictures available, items were assigned randomly to the two forms. The score was the total number right.

Street Gestalt Completion. The items consist of incomplete silhouettes, considered "representative of quickness of closure" (15, p. 9). The pictures, mounted on 3-by-5-inch cards, were presented one at a time. With the sample pictures (airplane, boy, sailboat), the aim was to orient *S* toward the picture as a whole, not toward details. If there was no answer or an incorrect one, the correct answer was supplied. The following instructions were then given: "On these cards there are some more pictures of the same kind. Not all of them will be as clear as the ones I have shown you. Look at each one, and as *soon* as you know what it is, tell me the name of the picture. Tell me *whatever it looks like as soon as you can.*" If there was no response at the end of 30 seconds, *S* was encouraged to say *whatever* the picture looked like. The card was removed when *S* answered, or at the end of 60 seconds. Forms A and B, nondrug and drug, each contained 12 items, alternately assigned from the original test. Scores were the number of correct responses; the number of rejections or failures to respond; and the number of unique responses, defined as incorrect responses not falling into a commonly used category and constituting less than five per cent of the responses.

Rorschach. Beck's instructions (1) were used. Each card was removed after five minutes. All *F* responses were scored either plus or minus, using Beck's norms, supplemented by Hertz's (7). For the drug test, the following additional instructions were included: "It doesn't matter whether the things you see are the same as the other day or not. Just tell me whatever you see while you look at the card, regardless of whether you mentioned it the other day or not."

Procedure

The Hands, Rorschach, and Gestalt Completion tests were given in that order, on different days, along with other tests from a larger battery. After an average interval of eight days, *Ss* received intravenous injections of sodium amytal and amphetamine sulfate

[1] From the Department of Psychiatry, College of Medicine, State University of Iowa. This investigation was supported in part by a research grant from the National Institute of Mental Health, of the National Institutes of Health, Public Health Service.

and were retested. The amphetamine sulfate counteracts the hypnotic effect of amytal (6). Details of the drug administration are given in (4). Testing was not begun until any unsteadiness or blurring of vision had disappeared.

Each *S*'s cooperation on each test was rated on a scale (8) from A to E. Only patients with C or better cooperation on both the nondrug and drug tests were included in the analysis; the large majority gave A or B cooperation. Because of lack of time or occasional instances of poor cooperation on particular tests, the *N* per group is sometimes below the total *N* listed above. Rorschach data were analyzed only for *S*s giving 15 or more responses both on the nondrug and drug tests. Where appropriate, analysis of variance was used; for the Hands test, the analysis was of logarithms of accuracy scores. For each chi-square test, scores for all diagnostic groups on both the nondrug and drug tests were pooled; the median of this distribution was used as the cutting score.

RESULTS AND DISCUSSION

Nondrug Performance

Analysis of the Rorschach *F*+% (Table 1) confirmed Beck's findings regarding perceptual inaccuracy in schizophrenia. A chi-square test, dividing *S*s at the over-all median of 70 per cent, showed significant differences among diagnostic groups ($p < .01$), with the two schizophrenic groups being lower than the nonschizophrenic groups. The question remains, however, whether conclusions regarding schizophrenic perceptual inaccuracy can be generalized to non-Rorschach tasks. Information relevant to this question is provided by the results of the Hands and Gestalt Completion tests.

TABLE 1

MEAN SCORES WITHOUT AND WITH DRUGS

Group	Rorschach				Hands No. Right		Gestalt Completion No. Right	
	F+%		No. Responses					
	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*
Nondrug								
CS	56.7	18.1	34.4	24.3	24.4	4.6	5.7	1.9
ES	63.1	17.2	37.2	28.6	23.6	5.0	6.9	1.7
Dp	78.5	14.5	25.2	8.9	25.3	3.5	5.4	1.4
Nt	75.1	12.6	45.5	28.6	25.6	3.8	6.9	2.0
Drug								
CS	56.0	16.8	33.1	20.2	21.9	4.8	6.3	2.6
ES	62.3	16.1	44.9	29.7	22.0	5.3	7.6	2.0
Dp	76.9	13.9	39.0	20.7	24.2	3.7	6.2	2.0
Nt	76.7	9.7	57.4	31.4	24.0	3.6	7.9	2.1

Note—The *N*'s were: Rorschach, CS 19, ES 19, Dp 16, Nt 21; Hands, CS 23, ES 21, Dp 21, Nt 21; Gestalt Completion, CS 23, ES 20, Dp 21, Nt 21.

Considering the requirements of the three tasks, all involve the identification of objects, but they vary in other respects. One variation is in the number of acceptable responses per stimulus, Hands and Gestalt Completion having one, whereas the Rorschach has a variety. Second, they differ in the proportion of cues provided for arriving at acceptable responses. In the Rorschach inkblots, the available cues are insufficient to specify objects with a high degree of certainty. At the other extreme, in the Hands test all the necessary cues are given. Gestalt Completion can be reasonably considered as intermediate in this respect. A third difference, related to the second, is in the number of possible responses per stimulus as limited by the instructions. For Hands there are only two possible answers, right or left; for Gestalt Completion, an intermediate number; and for the Rorschach, there is a very great variety. Fourth, the test stimuli differ in the type of discrimination required to arrive at an acceptable answer. For Hands it is necessary to discriminate small details; Gestalt Completion requires concentration on the whole form rather than on details; and in the Rorschach, *S* is free to concentrate on parts or wholes, as he wishes. Briefly, then, Hands may be regarded as highly structured, Gestalt Completion as intermediate, and the Rorschach as relatively unstructured.

On the Hands test, in contrast to the Rorschach, there were no significant differences in perceptual accuracy among the diagnostic groups (Table 1). Thus inaccuracy of perception in schizophrenia is not a generalized characteristic observable under all conditions.

On Gestalt Completion, the accuracy scores (Table 1) differed significantly among the groups ($p < .05$). The CS and Dp groups were significantly poorer than the other two groups ($p < .05$ in both cases), with the Dp group being poorest, although not significantly below the CS. The ES and Nt groups did not differ from each other.

Do these results indicate that under these conditions perceptual impairment is the same in chronic schizophrenia and depression? One similarity between the CS and Dp patients

is that they were on the average older than the other patients; therefore, their poor Gestalt Completion scores might be attributed to an age factor. For the four groups combined, however, the correlation between nondrug accuracy and age, although different from zero ($p < .01$), was small ($r = -.32$) and would account for only a small portion of the variation in score. Also, within any single group, the correlation with age did not differ from zero.

Analysis of the response records of the CS and Dp patients revealed certain striking differences. Considering first the CS patients, the inaccuracy indicated by their lowered $F+\%$ was also apparent in their high number of unique Gestalt Completion responses (Table 2). A chi-square test, cutting groups at the median of 1.5, showed significant differences among the groups ($p < .01$). The proportion of CS patients giving unique responses was much greater than in the other groups.

The outstanding characteristic of the Dp Gestalt Completion records was the preponderance of rejections (Table 2). A chi-square test, cutting the groups at 0 vs. 1 or more rejections, showed that the groups differed significantly ($p < .001$); this result is clearly due to the deviation of the Dp group from the others. Also, the only individuals who had more than four rejections were Dp patients. Since these patients were adequately cooperative, and since the 60-second time limit, which was double that used by Thurstone, appeared ample, it seems unlikely that with additional time more responses would have been given.

The lowered responsiveness associated with the poor Dp Gestalt Completion scores was also observable on the Rorschach (Table 1). A chi-square test, for which the over-all median was 28, indicated that the groups differed significantly in number of responses ($p < .05$), the Dp group giving fewer responses than the other groups.

The perceptual deficit in depression might be ascribed to overcontrol. The Dp patients appeared reluctant to respond unless the stimulus could be identified with great certainty. In the schizophrenics, particularly the chronic schizophrenics, the deficit seemed to depend, not on failure to respond, but rather

TABLE 2

GESTALT COMPLETION REJECTIONS AND UNIQUE RESPONSES

Group	Rejections				Unique Responses			
	Total No.		% *Ss* rejecting		Total No.		% *Ss* responding uniquely	
	Nondrug	Drug	Nondrug	Drug	Nondrug	Drug	Nondrug	Drug
CS ($N = 23$)	16	9	35	22	70	51	100	87
ES ($N = 20$)	15	12	50	30	30	19	70	50
Dp ($N = 21$)	63	22	86	43	33	28	62	76
Nt ($N = 21$)	6	3	24	14	31	26	67	81

on autism. These patients appeared willing to respond regardless of the stimulus structure, but their responses were often inappropriate (inaccurate and unique). The differences between schizophrenia and depression in quantity and quality of perceptual responses could be tested more directly. Binder's (3) recent formulation of the visual recognition process is relevant to this problem. A suitable technique has been described by Smock (13); a graded series of stimuli is presented, with each successive stimulus containing a higher proportion of cues necessary for object identification.

Effect of Drugs

On the Hands test all groups decreased in accuracy with drugs ($p < .001$). This is in accord with our previous findings, for these patients, of the detrimental effect of the drugs when a highly precise response is required (9, 12).

On the less structured tests, Gestalt Completion and Rorschach, no such impairment of accuracy was evident. On Gestalt Completion all groups improved in accuracy ($p < .01$). This may be due to a general increase in responsiveness with drugs, as previously suggested (12). Such a drug effect is indicated by the decrease in rejections shown by all groups; a chi-square test indicated that there were no longer significant differences among the groups. On the Rorschach, also, in terms of percentage change in number of responses, all groups were more responsive; the means were as follows: CS, +8.0%; ES, +31.3%; Dp, +57.3%; and Nt, +33.6%.

The decrease in unique Gestalt Completion

responses was somewhat greater in the schizophrenic than in the nonschizophrenic groups (Table 2); a chi-square test no longer showed significant differences among groups. With the drugs, autism appears reduced under intermediately structured conditions.

The schizophrenic groups did not show an increase in $F+\%$. The changes with drugs in $F+\%$ were very slight in all groups; a chi-square test showed that the groups still differed significantly ($p < .001$), the two schizophrenic groups again being the lowest. These Rorschach results are consistent with those of Layman (11) and of Kelley *et al.* (10) regarding the effect of amytal. In the latter study, the patients were much more productive with amytal, but their pathological behavior was still apparent.

Thus, the schizophrenic patients improved with drugs in Gestalt Completion accuracy and uniqueness but not in Rorschach $F+\%$. A possible interpretation of this discrepancy is that the drugs increase the schizophrenic patient's accuracy in perceiving his environment, provided the environment to be perceived is not too vague and unstructured, as are the Rorschach inkblots.

The most striking drug effects were seen in the Dp patients on the two less structured tests. On Gestalt Completion their rejections decreased very markedly; half the Dp patients who previously had made rejections no longer did so with drugs. On the Rorschach their mean number of responses increased, and this group showed the greatest percentage of increase in responses. On these tasks, then, the drugs seemed to reduce the excessive control of the Dp patients, permitting them to respond more freely.

SUMMARY AND CONCLUSIONS

Three perceptual tests were given to four groups of hospitalized patients: chronic schizophrenics, early schizophrenics, depressives, and neurotics. The tests, Hands, Street Gestalt Completion, and Rorschach, were administered first without and then with intravenous sodium amytal and amphetamine sulfate.

Without drugs, on the Hands test, the groups did not differ in accuracy. On Gestalt Completion the CS and Dp groups gave fewer correct responses than the ES and Nt groups. The perceptual impairment in the CS group was associated with uniqueness of response, that in the Dp group with failures to respond. Beck's finding of lowered Rorschach $F+\%$ in schizophrenia was confirmed.

With drugs, on the Hands test, all groups were less accurate. On Gestalt Completion, all groups were more accurate and gave fewer rejections and unique responses. There was no change in Rorschach $F+\%$; in terms of percentage of change in number of responses, all groups showed an increase.

The following conclusions were tentatively formulated:

1. Demonstration of perceptual disturbance in schizophrenia depends on the structure of the task; it is not observable under all conditions. In early schizophrenia the psychopathology was clearly demonstrable only in the relatively unstructured Rorschach situation. In chronic schizophrenia the psychopathology was also observable on the intermediately structured Gestalt Completion test.

2. The preceptual deficit in depression is ascribed to excessive inhibitory control; that in schizophrenia, particularly chronic schizophrenia, is attributed to autistic inappropriateness.

3. The drugs improve perceptual behavior by enhancing environmental contact in schizophrenia, provided the environmental stimulus conditions are moderately well structured, and by reducing the excessive inhibitory control in depression.

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THE RELATIONSHIP OF HOSTILITY TO AUTHORITARIANISM[1]

SAUL M. SIEGEL

University of Buffalo[2]

THE literature relevant to the relationship between hostility and authoritarianism is fairly consistent. It is the general consensus that everyone has feelings of hostility but that the authoritarian personality is specifically characterized by such feelings. Fromm (3) sees the authoritarian as a hostile individual, particularly in his relationship toward those whom he perceives as powerless. "The very sight of the powerless person makes him want to attack, dominate, humiliate him." In like respect, Maslow (6) sees hostility as one of the basic attributes of the authoritarian character, the feeling usually directed toward a scapegoat. The formulations drawn by Adorno, Frenkel-Brunswik, Levinson, and Sanford (1) are in agreement with Fromm and Maslow. They find that the authoritarian tends to project hostility on the environment in a diffuse, intense, and often irrational manner. By comparison, the nonauthoritarian personality is believed to accept his feelings of hostility and express such feelings rationally in a specific and channelized direction.

In the present study the attempt was made to determine the authoritarian personality's predisposition toward hostility. It was felt that such predisposition could best be determined by psychological tests that are not explicit in their reference to hostility. Two independent tests of hostility were used: an objective test, the Manifest Hostility Scale, and a projective test, the Elizur scoring system on the Rorschach.

PROCEDURE

The Manifest Hostility Scale. The objective test was developed by the present writer specifically for this study and is referred to as the Manifest Hostility Scale (MHS). This scale was developed in the same manner as that utilized by Taylor (8) in developing her Manifest Anxiety Scale. The Minnesota Multiphasic Personality Inventory was scanned for all items that might possibly reflect hostility. One hundred ten items were selected from the MMPI and four items, devised by the present writer, were added to this list. This list was submitted to five judges with the instructions to sort out those items which reflect manifest hostility. The definition of manifest hostility that was to be used as a criterion was drawn from a Veterans Administration technical bulletin on psychiatric nomenclature (9). There was 80 per cent or better agreement on 53 of the 114 items. Three items were eliminated either because they were repetitions of other items or because they were deemed difficult to comprehend. It was found that 18 of the final 50 items were already included as buffer items of the Taylor scale. The remaining 32 items were randomly substituted into the Taylor scale without displacing any of the anxiety items. The odd-even reliability coefficient of the MHS, corrected for attenuation, was found to be .84. The hostility items are listed in Table 1.

The Elizur Rorschach Content Test. The second scale used was the Rorschach Content Test of hostility (RCT-h). This technique, developed by Elizur (2), is based on an analysis of Rorschach free-association content. Rorschach responses containing clear evidence of hostility, such as animals fighting, are given a score of 2, while responses containing less clear-cut evidence of hostility, such as knife, are given a score of 1. The total score of a protocol gives a quantitative indication of amount of hostility. In the present study, two judges scored the results from this scale. The interrater reliability was .78.

Subjects. Two independent populations were used. The first, a university population, consisted of 60 white male students enrolled in the first semester course of elementary psychology at the University of Buffalo. Mean age was approximately 19 years (SD = 2.1) and mean education approximately 13.5 years (SD = 1.0). The second consisted of 60 white male veterans selected in serial order from those applying for treatment at the mental hygiene clinic of the Buffalo Veterans Administration Regional Office. Mean age was approximately 29 years (SD = 5.7) and mean education approximately 11 years (SD = 2.3). Wechsler-Bellevue subtests of Comprehension, Block-Design and Digit-Symbol revealed an estimated mean IQ of 111 (SD = 12.0). Psychotic veterans and those with intracranial organic pathology were eliminated from this sample.

Pilot studies were performed to determine the approximate range of F-scale scores to be expected from the two populations. The numerical ranges indicating the top, middle, and bottom 15 per cent were then noted to determine the high, middle, and low F-scale score cutoff points. In the study proper, individuals whose F-scale scores fell within these predetermined ranges became *S*s. The F-scale score ranges of the high, middle, and low F-scale groups of the university population were respectively 4.30–5.17 (M = 4.64), 3.50–3.80

[1] The present paper is a condensation of part of a doctoral dissertation submitted to the faculty of the Department of Psychology of the University of Buffalo in partial fulfillment of the requirements for the Ph.D. degree. The writer is greatly indebted to Doctors Marvin Feldman, Olive Lester, and Llewellyn Gross under whose direction this investigation was completed.

[2] Now at Topeka State Hospital, Topeka, Kansas.

TABLE 1

MANIFEST HOSTILITY SCALE ITEMS

1. I have often found people jealous of my good ideas, just because they had not thought of them first. (True)
2. I don't blame anyone for trying to grab everything he can get in this world. (True)
3. It is safer to trust nobody. (True)
4. I am often inclined to go out of my way to win a point with someone who has opposed me. (True)
5. I have very few quarrels with members of my family. (False)
6. I think nearly anyone would tell a lie to keep out of trouble. (True)
7. I am easily downed in an argument. (False)
8. I am not easily angered. (False)
9. When someone does me a wrong I feel I should pay him back if I can, just for the principle of the thing. (True)
10. I have at times stood in the way of people who were trying to do something, not because it amounted to much, but because of the principle of the thing. (True)
11. Some of my family have habits that bother and annoy me very much. (True)
12. I have at times had to be rough with people who were rude or annoying. (True)
13. It is all right to get around the law if you don't actually break it. (True)
14. I like to poke fun at people. (True)
15. Someone has it in for me. (True)
16. I easily become impatient with people. (True)
17. I do not blame a person for taking advantage of someone who lays himself open to it. (True)
18. Most people are honest chiefly through fear of being caught. (True)
19. I sometimes tease animals. (True)
20. I have frequently worked under people who seem to have things arranged so that they get credit for good work but are able to pass off mistakes onto those under them. (True)
21. Some people are so bossy that I feel like doing the opposite of what they request, even though I know they are right. (True)
22.* I like to play practical jokes on others. (True)
23. I am often so annoyed when someone tries to get ahead of me in a line of people that I speak to him about it. (True)
24. I know who is responsible for most of my troubles. (True)
25. At times I have a strong urge to do something harmful or shocking. (True)
26. In school I was sometimes sent to the principal for cutting up. (True)
27. I am often sorry because I am so cross and grouchy. (False)
28.* I often feel irritable. (True)
29. I am sure I get a raw deal from life. (True)
30. At times I feel like smashing things. (True)
31. I get angry sometimes. (True)
32. In school my marks in deportment were quite regularly bad. (True)
33. I think most people would lie to get ahead. (True)

TABLE 1—*Concluded*

34. Sometimes I feel as if I must injure either myself or someone else. (True)
35. If people had not had it in for me I would have been much more successful. (True)
36. I believe I am being followed. (True)
37.* I never have "temper tantrums." (False)
38. I believe I am being plotted against. (True)
39. Someone has been trying to rob me. (True)
40. I have no enemies who really wish to harm me. (False)
41. I do not try to cover up my poor opinion or pity of a person so that he won't know how I feel. (True)
42. I am often said to be hotheaded. (True)
43. I commonly wonder what hidden reason another person may have for doing something nice for me. (True)
44. I get mad easily and then get over it soon. (True)
45. At times I feel like picking a fist fight with someone. (True)
46. Sometimes I enjoy hurting persons I love. (True)
47. I can easily make other people afraid of me, and sometimes do for the fun of it. (True)
48. Horses that don't pull should be beaten or kicked. (True)
49. Most people make friends because friends are likely to be useful to them. (True)
50. There are certain people I dislike so much that I am inwardly pleased that they are catching it for something they have done. (True)

* Items devised by author.

(M = 3.62), and 1.70–3.00 (M = 2.65). For the veteran population, the ranges were 4.63–5.90 (M = 5.11), 3.97–4.60 (M = 4.29), and 2.70–3.87 (M = 3.50) respectively.

Within each population there were 20 *S*s in each of the three F-scale categories. The *S*s who fell within the F-scale ranges for each group were tested with the Rorschach and MHS.

RESULTS

Since it is possible that intellectual differences may affect test responses, correlations with intelligence were computed. The correlation between F-scale and ACE scores in the university population was −.19. The correlation between F-scale and the three Wechsler-Bellevue subtest scores in the veteran population was −.21. Neither of these values was statistically significant.

The rank-order correlation between the MHS and the RCT-h scale was +.17 in the university population and +.01 in the veteran population. Neither of these values was statistically significant.

Tables 2, 3, and 4 present the MHS data relevant to the analysis of differences among

TABLE 2

PERFORMANCE ON THE MANIFEST HOSTILITY SCALE IN RELATION TO F-SCALE SCORE

(N = 20 per group)

F-Scale Group	Mean MHS	SD
University		
High	17.2	6.3
Middle	12.6	7.0
Low	12.6	5.7
Veteran		
High	20.8	5.2
Middle	16.8	7.5
Low	14.0	8.6

TABLE 3

ANALYSIS OF VARIANCE OF MANIFEST HOSTILITY SCALE SCORES WITH RESPECT TO F-SCALE GROUPS

Source of Variation	df	Mean Square	F
University			
Between groups	2	136.52	3.56*
Within groups	57	38.35	
Veteran			
Between groups	2	236.81	4.66*
Within groups	57	50.86	

* Significant at .05 level.

TABLE 4

COMPARISON OF F-SCALE GROUPS IN TERMS OF MEAN SCORE ON MANIFEST HOSTILITY SCALE

F-Scale Groups Compared	SE_D	t
University		
High-Low	1.92	2.34*
High-Middle	1.92	2.37*
Middle-Low	1.92	.03
Veteran		
High-Low	2.25	3.04**
High-Middle	2.25	1.78
Middle-Low	2.25	1.27

* Significant at .05 level.
** Significant at .01 level.

the F-scale groups. The MHS data were demonstrated to be normally distributed and therefore normal curve statistics were used.

Table 2 shows a direct relationship between F-scale and MHS scores. Table 3 indicates that this relationship is well beyond the minimum levels of significance in both populations. Table 4 locates the significant difference between the high and the low and the high and the middle F-scale groups in the university population and the high and low F-scale groups in the veteran population. The correlation between MHS and IQ scores in the university population was −.14. In the veteran population it was −.18. Neither of these correlations was statistically significant.

Tables 5, 6, and 7 present the RCT-h data relevant to the analysis of differences among F-scale groups. The RCT-h data of the veteran population were not normally distributed. These data were normalized by a square-root transformation.

Table 5 shows a tendency in both populations toward an inverse relationship between F-scale and RCT-h scores. This tendency is statistically significant in the veteran population (Table 6), the significant difference lying between the high and low F-scale groups (Table 7). The correlation between RCT-h and IQ scores in the university population was +.05. In the veteran population it was +.14.

TABLE 5

PERFORMANCE ON THE ELIZUR RORSCHACH CONTENT TEST OF HOSTILITY IN RELATION TO F-SCALE SCORE

(N = 20 per group)

	Mean		SD	
F-Scale Group	Original	Transformed	Original	Transformed
University				
High	2.5		2.3	
Middle	2.0		2.2	
Low	3.4		2.8	
Veteran				
High	2.8	1.5	2.4	.8
Middle	3.5	1.6	3.5	.9
Low	5.4	2.2	4.5	.9

TABLE 6

ANALYSIS OF VARIANCE OF RCT-h SCORES WITH RESPECT TO F-SCALE SCORE GROUPS

Source of Variation	df	Mean Square		F	
		Original	Transformed	Original	Transformed
University					
Between groups	2	9.69		1.71	
Within groups	57	5.67			
Veteran					
Between groups	2	38.08	2.45	3.16*	3.22*
Within groups	57	12.05	.76		

* Significant at .05 level.

TABLE 7

COMPARISON OF VETERAN F-SCALE GROUPS IN TERMS OF MEAN SCORE ON ELIZUR RORSCHACH CONTENT TEST OF HOSTILITY

F-Scale Groups Compared	SE_D		t	
	Original	Transformed	Original	Transformed
High-Low	1.09	.28	2.46*	2.43*
High-Middle	1.09	.28	.69	.61
Middle-Low	1.09	.28	1.77	1.82

* Significant at .02 level.

Neither of these correlations was statistically significant.

DISCUSSION

The discrepant results obtained with the two hostility tests demands an examination of the tests. Several studies have reported the validity of the RCT-h against external criteria (4, 7). As the MHS has yet to be independently verified, it is possible that this scale is less valid than the RCT-h. This possibility is minimized, however, by the fact that the results obtained with the MHS are consistent with the expectations suggested by the literature, i.e., authoritarian groups obtained the highest hostility-score means.

Assuming for the purpose of discussion that both tests are valid, it is possible that they measure different aspects of hostility. The MHS is an objective test apparently reflecting the degree to which the individual is willing to express hostility. The RCT-h is a projective technique and thus may reflect hostility which the individual is not willing to express. The fact that the more authoritarian groups obtained the highest MHS scores while the less authoritarian groups obtained the highest RCT-h scores suggests that, contrary to expectations, the groups may not differ as greatly in amount of hostility they possess, but instead may differ in their readiness to express their hostility. The lack of consistent statistical results indicates that such a statement must be held tentative at this time.

The following rationale is suggested to account for the discrepant test results:

The authoritarian and nonauthoritarian personalities both possess feelings of aggression, the former much more than the latter. But the authoritarian has learned that the manifestation of aggression through manifest hostility is consistent with his other personality needs and that such expression is reinforcing.

On the other hand, the nonauthoritarian has learned that to be consistent with other personality needs, he need not, or possibly must not, express his aggression through manifest hostility. What he has learned is also reinforcing in that by *not* expressing manifest hostility, he maintains consistency in his personality. Therefore, the nonauthoritarian has kept his aggression on a latent level, expressing it only in an indirect manner.

It is of some incidental interest to note that in discussing authoritarian hostility, most writers use terminology generally negative in value. Thus, for example, such expressions as "irrational," "social inferior," "distrust," are found together with a tendency to speak of the authoritarian in general with such terms as "maladjusted" or "poorly integrated." In contradistinction, nonauthoritarian hostility is spoken of as "rational," and "well-channelized," together with more general characteristics as "well-integrated" and "judicious." Masling (5) has specifically pointed out the degree to which value judgments regarding authoritarian and nonauthoritarian personalities have permeated the literature. Possibly the tendency to ascribe culturally unacceptable traits to the authoritarian and culturally acceptable ones to the nonauthoritarian has become so generalized that a halo effect is influencing the interpretation of experimental results.

SUMMARY

The tests of hostility were administered to groups differing in degree of authoritarianism. The first test, a manifest hostility scale, consisted mainly of items drawn from the Minnesota Multiphasic Personality Inventory that were judged by clinicians to be indicative of manifest hostility. The second test was the Elizur Rorschach Content Test.

Statistical analysis of the relationship between the manifest hostility scale and authoritarianism indicated that groups high on the dimension of authoritarianism have greater overt hostility than groups lower on this

dimension. Results relevant to the relationship between the Rorschach Content Test and authoritarianism indicated a less certain tendency for groups low on the dimension of authoritarianism to have greater covert hostility than groups higher on this dimension.

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BODY-IMAGE BOUNDARIES AND STYLE OF LIFE

SEYMOUR FISHER AND SIDNEY E. CLEVELAND
VA Hospital, Houston, Texas

THE concept of body image has had wide currency in various contexts. In the literature concerned with body image, one finds such diverse interests as the relationship of body image to schizophrenia (10, 24), neurosis (10, 24), organic brain pathology (21, 24), mode of child rearing (3), asthma (4), existence of an artificial opening in the body (18), hypnotic distortions (28), events in psychotherapy (8), and sexual identification (9, 16). By and large, these past studies have been based on impressionistic, clinical data, and the generality of results from them has consequently been limited.

More systematic techniques have recently been employed in studying body-image phenomena. Thus, various figure-drawing indices, which constitute a kind of body-image measure, have been related to personality and disease variables (5, 12, 17). The Rorschach has likewise been used in a semiquantitative manner to evaluate aspects of body image (27). Some investigators (14, 25) have used word association and self-rating techniques in their approach to body-image phenomena. Almost all of these studies have focused on the degree to which the individual shows positive or negative feelings toward his body. The indications are that those who regard their bodies negatively tend to be more disturbed in other psychological areas than do those who regard their bodies positively (14, 25).

In a previously completed series of studies of the relationship between aspects of the body image and site of various body symptoms (5, 6, 11), it was demonstrated that individuals differ markedly in the degree to which they conceive of their bodies as enclosed by defensive, impermeable boundaries. More specifically, patients with psychosomatic symptoms involving the exterior body layers (e.g., arthritis or neurodermatitis) tend to conceive of their bodies as sheathed by an armored barrier. They picture themselves as enclosed by tight boundaries and defended against external penetration. Patients with symptoms involving the body interior (e.g., stomach ulcers or ulcerative colitis), on the other hand, tend to conceive of their bodies as having thin boundaries that are easily penetrated. In this group, the body-image boundaries are fluid and vague rather than fixed and barrier-like. It is as if these individuals feel stripped of their body exteriors and experience their body interiors as directly exposed to whatever impinges upon them. The data indicate that such differences are associated with variations in personality organization. It was shown that the "choice" of site for a psychosomatic symptom was but one manifestation of a more general approach to life. Within the limits of the patient population studied, differences in body-image boundaries were significantly linked with certain patterns of attitudes toward the parental figures, with certain habitual modes of self-expression, and with certain values and areas of interest (5, 6, 11).

In considering why personality differences occur in individuals who place varying degrees of emphasis on the defensive barrier qualities of their body exteriors, one may speculate about some obvious contrasts between the possible psychological significance of the body exterior and of the body interior. The outer body layers (skin and muscle) are distinguished from the body interior in being more subject to voluntary control. Thus, the skin's appearance can be changed by various means of adornment. Likewise, the striate musculature provides one of the chief modes of voluntary expression. The body interior, however, is an area of involuntary response and much less subject to direct control. Too, the skin and musculature are literally that part of himself which the individual shows most openly to the world. They are the most obvious representations of himself, the first line of physical involvement in a situation. Over all, one may contrast the body exterior with the body interior as representing more the voluntary, conscious, and "in-contact-with-the-outside" aspects of the individual.

Because the body-image boundary concept had significant applications to psychosomatic phenomena, the question arose of its usefulness

in clarifying the behavior of normal persons. Would this concept, derived from observations of extreme groups containing individuals who had broken down under stress, have meaningful applicability to normals? The present study is an initial attempt to answer this question.

METHOD AND EMPIRICAL PREDICTIONS

Subjects. The *S*s consisted of 87 undergraduate students enrolled in two different introductory psychology courses at the University of Houston. There were 29 women and 58 men. All *S*s were examined on a group basis.

Body-image indices. The rationale of the technique used to evaluate body-image fantasies has been described in detail elsewhere (11). Briefly, Rorschach protocols, previously found to yield the richest data concerning body-image boundaries, were scored for two variables represented by a Barrier score and a Penetration-of-Boundary score.

The Barrier score is an index of the degree to which the individual regards his body exterior as a defensive barrier that is armored against penetration. It is arrived at by tabulating all responses in which there is an emphasis on the protective covering or armoring characteristics of the periphery of a percept. Examples of such responses include "Turtle with a shell," "Cave with rocky walls," "Man in armor." The Penetration-of-Boundary score is an index of the degree to which the individual regards his bodily boundaries as easily penetrated. It is determined by counting all responses in which there is a focus on the idea that the periphery of a percept is open, soft, or easily invaded. Some typical examples are "Body cut open," "Bullet entering flesh," "Entrance to a house." It has been shown that both of these body-image indices may be derived from Rorschach records by various scorers with an adequate level of interscorer agreement (11). Thus, two judges independently evaluated twenty Rorschach records. When their scores were compared, the rho correlation for Barrier responses was .82; for Penetration-of-Boundary responses it was .94. Two judges who independently scored another set of twenty Rorschach records showed a correlation of .96 for the Barrier score and a correlation of .93 for the Penetration-of-Boundary score.

The present Rorschach records were obtained from *S*s on a group basis. The *S*s were asked to give a definite number of responses to each card in order to equalize the response total throughout the group. Three responses were obtained for four cards (I, II, III, VII) and two responses for the other six.

Other variables. The kind of information that it was decided to collect from each *S* aside from the body-image indices, was a function of certain leads suggested by the previous results obtained from psychosomatic patients.

Since exterior vs. interior body symptoms had been one of the chief dimensions distinguishing patients with different body-image indices (11), it was planned to inventory the range of body symptoms that had already been experienced by the normal *S*s. It was predicted that high Barrier scores would be associated with exterior body complaints and high Penetration scores with interior body complaints. Each *S* was asked to indicate on a check list whether he had had symptoms involving any of seven different exterior and interior areas of the body.

Similarly, it has previously been found that patients who emphasized the body exterior tended to engage in such strenuous muscular activity as participation in sports (11). It had also been found that particular groups of patients who emphasized the body exterior showed more interest in such other activities as cooking and political participation than did patients who emphasized the body interior. These differences in interest seemed to represent important differences in life orientation. Therefore, *S*s in the normal group were asked to fill out a questionnaire, describing in detail their activities in these life areas. The prediction was made that *S*s with less permeable body-image boundaries would show more interest in athletics, law, and cooking than *S*s with more permeable boundaries. These were arbitrary empirical predictions based on the previous findings.

The F scale was included in the battery for exploratory purposes to determine if there were broad differences in ideological orientation between those with different body-image concepts.

Finally, each subject was asked to write a story based on five different TAT cards (1, 2, 7BM, 6GF, 6BM) projected on a screen. It was intended to use the TAT data in a semiexploratory fashion to find out if differences in body-image concept might be associated with three TAT variables: level of aspiration, attitudes towards parents, and deceptiveness.

Level of aspiration was chosen as one TAT variable simply on the basis of hints from earlier work (11) that emphasis on the exterior (skin-muscle) layers of the body might be correlated with an active, "muscular," achieving attitude toward the world. In order to evaluate the level of aspiration, two indices were derived from each *S*'s TAT stories. One index (High Aspiration) was simply a count of all statements which referred to a story character's hoping for high achievement, working hard, or having attained high goals. A second index (Inactivity) involved counting all statements in which a character was described as asleep, daydreaming, bored, or resting. It was hypothesized that *S*s with less permeable boundaries would obtain higher aspiration scores and lower inactivity scores than *S*s with more permeable boundaries.

A second TAT area had to do with attitudes toward parental figures. Two raters working together and on a blind basis evaluated for each *S* all stories involving mother figures and all those involving father figures. The role assigned to each parental figure was categorized as predominantly friendly and helpful or predominantly negative and hostile. When the data were too vague to make such specific postive or negative categorizations, a category of "insufficient information" was noted. The question asked here was whether the body-image indices were in any way significantly linked with the positive friendliness or negative hostility of the role assigned in fantasy to the parental figures. No prediction was made concerning the hostility score.

Fantasies about parental figures were also evaluated on a continuum of Weakness-Vagueness as against Defi-

niteness-Forcefulness. The concern here was not with direction of attitude toward parents, but rather with the definiteness of the image of the parents. This variable was evaluated by considering TAT cards, 2, 7BM, and 6BM as evoking relatively more associations concerning parental figures than the other cards used in the study. It was then assumed that individuals with definite attitudes toward the parental figures should make specific positive or negative statements about both mother and father on Card 2, about father on 7BM, and about mother on 6BM. If an individual made a definite statement about both parents on Card 2 he was given a credit of +1 for each of these statements and was likewise given a credit of +1 for a definite positive or negative characterization of father on 7BM and another +1 for such a characterization of mother on 6BM. Thus, a maximum of +4 could be attained for the highest degree of Definiteness. If an *S* gave a weak or not definitely positive or negative description of one parent on Card 2 he was given a penalty score of −1. An unclear description of both parents on this card resulted in a penalty of −2. Another penalty unit could be obtained for Card 7BM and also one for 6BM. The maximum penalty score was −4. An individual's final Definiteness score was equal to the difference between the total number of plus and minus units. The most definite image of the parents would result in a score of + 4 and the least definite image would be represented by a score of −4. Determinations of plus or minus values for each card were made by two raters working together on a blind basis. It was predicted that individuals who emphasize the barrier aspects of the body exterior would perceive the parental figures in relatively definite terms.

Another TAT index is referred to as Exterior Deception. This measure is a count of all instances in which a character is described as overtly acting or appearing in a certain way but as having internal motives quite different from the surface appearance. An example of this measure is provided by a story in which a man smiles in a friendly way at a woman, but all the while intends to hurt her. It was argued that individuals emphasizing the barrier aspects of the bodily surface tend to think of the body exterior as a screen or shield concealing one's true inner state. Consequently, it was predicted that such persons would score relatively high on this variable.

RESULTS

The nonparametric Median Test (29) was employed to determine if there were any sex differences in the distributions of the two body-image indices. No significant differences were found. The same test was then used to evaluate the significance of the various score differences between the two halves of the Barrier index distribution. As indicated by Table 1, those *S*s with the higher Barrier scores manifest significantly more exterior bodily symptoms than do those with lower Barrier scores. They report a significantly greater number of symptoms involving the skin and musculature. The high-barrier group is significantly more active in athletics, more productive of TAT themes with High Aspiration implications, and more likely to give TAT stories in which there is Exterior Deception. The high-barrier group produces a numerically smaller incidence of inactivity themes, but the difference is not significant (.05–.10).

TABLE 1

NONPARAMETRIC MEDIAN TESTS OF DIFFERENCES IN VARIOUS SCORES BETWEEN THE UPPER AND LOWER HALF OF THE BARRIER SCORE DISTRIBUTION OF THE EXPERIMENTAL GROUP

Score	Barrier group with larger score	*p*
Exterior body symptoms	H*	.02
Interior body symptoms	L*	—
TAT high aspiration	H	.01
TAT inactivity	L	.05–.10
TAT exterior deception	H	.01–.02
F scale	L	—
Participation in athletics	H	.02–.05
Participation in cooking	N.D.**	—
Interest in law and politics	N.D.	—
Degree of TAT hostility toward mother	N.D.	—
Degree of TAT hostility toward father	N.D.	—
Definiteness of TAT attitude toward both parents	H	.01

* H = High-barrier group, L = Low-barrier group.
** N.D. = No difference.

The high-barrier group, while not differing from the low-barrier group with respect to the *direction* of feeling toward the parental figures in their TAT stories, was significantly more definite in attitude toward these figures. At the .01 level of significance, the high-barrier group more frequently gave TAT descriptions of the parents which could be classified as definitely positive or negative.

High-barrier *S*s also reported numerically fewer body interior symptoms than the low-barrier group, but this difference was not statistically significant. Differences between the groups in terms of interest in cooking, interest in law, and F-scale scores were likewise not significant.

The Median Test was also utilized to test the significance of the score differences between the upper and lower halves of the Penetration-of-Boundary distribution. As in-

TABLE 2

NONPARAMETRIC MEDIAN TESTS OF DIFFERENCES IN VARIOUS SCORES BETWEEN THE UPPER AND LOWER HALF OF THE PENETRATION-OF-BOUNDARY SCORE DISTRIBUTION OF THE EXPERIMENTAL GROUP

Score	Penetration group with larger score	p
Exterior body symptoms	N.D.	—
Interior body symptoms	L*	.05–.10
TAT high aspiration	H*	.02–.05
TAT inactivity	N.D.**	—
TAT exterior deception	N.D.	—
F scale	N.D.	—
Participation in athletics	N.D.	—
Participation in cooking	N.D.	—
Interest in law and politics	N.D.	—
Degree of TAT hostility toward mother	N.D.	—
Degree of TAT hostility toward father	N.D.	—
Definiteness of TAT attitude toward both parents	N.D.	—

* H = High-penetration group, L = Low-penetration group.
** N.D. = No difference.

dicated by Table 2, the only difference attaining significance was that involving High Aspiration. Those *S*s with higher Penetration-of-Boundary scores gave a significantly greater number of high-aspiration TAT themes than did those with lower penetration scores.

In a total overview of the results, one can see that the Barrier score is successfully differentiating in five of twelve tests of significance. The Penetration-of-Boundary score, however, proves to be significantly differentiating in only one of twelve tests. A tetrachoric correlation of −.12, which is not significant, was found between the Barrier score distribution and the Penetration-of-Boundary score distribution. The two scores may therefore be treated as independent variables. Consequently, while the one significant difference obtained with the Penetration score is of a chance order, the five significant differentiations associated with the Barrier score, all approximating the .01 level, exceed the number of significant differences one would expect by chance to obtain in twelve tests of significance. These Barrier index results were further analyzed by intercorrelating the three TAT scores which are significantly related to the Barrier score. If the three TAT scores were fairly highly intercorrelated and actually represented a single broad dimension, it would reduce the five significant tests obtained to three and lessen considerably the importance of the findings.

Tetrachoric correlations were used to test the interrelationships among these TAT measures, since the distributions seemed to fulfil the assumptions of continuity and normality. The three correlations obtained were .04 (High Aspiration vs. Parental Definiteness), .23 (Exterior Deception vs. Parental Definiteness), and .37 (High Aspiration vs. Exterior Deception). None of these coefficients is significant. It may be noted incidentally that when the intercorrelations of all the dependent variables were computed, it was found that they also were not significant and may be regarded as essentially independent.

In order to check on the stability of the significant results obtained with the TAT measures, it was decided to do a cross-validation study on a new group. Thirty-eight women enrolled in a graduate psychology course at the University of Houston were used as *S*s. The TAT and Rorschach were administered on the same basis as has already been described for the first experimental group. Scores were computed for only those variables which had been significant or close to significance in the first study. Thus, only the Barrier score was determined from the Rorschach, since the Penetration-of-Boundary score had given almost completely negative results. The High Aspiration, Inactivity, and Parental Definiteness scores were determined from the TAT data. It was not possible to test the Exterior Deception score because less than a fifth of the 38 *S*s gave scorable responses on this variable.

TABLE 3

NONPARAMETRIC MEDIAN TESTS OF DIFFERENCES IN VARIOUS TAT SCORES BETWEEN THE UPPER AND LOWER HALF OF THE BARRIER SCORE DISTRIBUTION OF THE CROSS-VALIDATION GROUP

Score	Barrier group with larger score	p
TAT high aspiration	H	.02–.05
TAT inactivity	L	.05–.10
Definiteness of TAT attitude toward both parents	H	.05

The results in Table 3 suggest a high degree of stability in the findings involving the TAT measures. The high-barrier group was again significantly higher in Aspiration and Definiteness, and the Inactivity scores again indicated that the low-barrier group produced numerically more themes of inactivity than the high-barrier group. This difference falls at the .05–.10 level of significance as was the case for the first sample. It cannot be considered as significant. However, the fact that it was of borderline significance on two occasions suggests that it is a variable worthy of further study. The tetrachoric intercorrelations of the three TAT measures ranged from .01 (High Aspiration vs. Parental Definiteness) and .23 (Exterior Deception vs. Parental Definiteness) to .39 (High Aspiration vs. Exterior Deception). None of these coefficients approached significance.

DISCUSSION

It is interesting to note that the results obtained confirm, within a normal group, a basic relationship that was previously shown (11) to exist between body image and site of symptomatology in individuals with serious psychosomatic symptoms. The results indicate that normal *S*s who dramatize the barrier value of their body-image boundaries report experiencing significantly more physical difficulties involving exterior body layers than do those not emphasizing exterior boundaries in their body image. Thus, the relationship holds true even within a normal group where the physical difficulties reported are very minor and generally cannot be considered as formal illnesses.

The most important results emerging from the study have to do with the high level of activity and aspiration manifested by those with high Barrier scores as contrasted to those with low Barrier scores. The high Barrier scorers are significantly higher in degree of participation in athletics and also higher in the number of TAT themes they produce involving hard work and the pursuit of high goals. These differences suggest that those who stress the defense value of their body exteriors are more likely to take an active, "muscular" attitude toward life, emphasizing values having to do with getting to the top. The low-barrier group is more flaccid in its orientation. It is intriguing to speculate as to the basis for this broad difference in life style. As was pointed out earlier, an emphasis on the exterior body layers means emphasis on the skin and the striated musculature. These tissues constitute the part of the individual most directly in contact with reality. Skin and musculature contrast with the interior of the body which is relatively less available as a voluntary means for setting up relationships to the external world. It could easily follow that emphasis on the body-image boundary is a reflection of a style of life based on an unusually strong definition of self-identity and on active self-expression aimed at establishing a stable, controlling relationship to the environment.

Such an interpretation is consistent with the finding that the high-barrier group produced significantly more Exterior Deception themes. That is, high-barrier people are more likely than low-barrier people to regard life as full of potential deception and to perceive people as concealing their real intentions. This raises the question whether under conditions of severe personality regression (e.g., schizophrenic breakdown) they would have a greater tendency to show paranoid symptoms than would low-barrier people.

Too, finding that *S*s with high Barrier scores give significantly more Definite and Forceful TAT descriptions of parental figures suggests a different pattern of relationship with parents. Perhaps this variation in pattern of relationship is an important factor in determining body-image differences. It would appear that more definite body boundaries may represent an identification with parents who provided a well-defined model either positively or negatively. That is, *S*s whose parents stood for certain definite values and ways of doing things may have had more definite models after which they could fashion an image of self in contrast to *S*s whose parents appeared weak and indefinite and afforded only hazy models.

The gross typological differentiation of *S*s into those with high and those with low Barrier scores is analogous to certain concepts which have been reported in the literature. Thus, one is struck by a possible relationship between Mowrer's (20) two-factor learning theory and the Barrier concept. Mowrer takes the position that learning which involves the

striated musculature is qualitatively different from learning which involves more involuntary body interior functioning, such as autonomic response. Others (7, 13, 23) have also commented on the difference between learning which involves striated muscle functioning and learning dependent upon subcortical factors. The goal-directed implications of striated muscle learning have been contrasted with the more diffuse, poorly goal-oriented aspects of subcortical learning. Little has been said by Mowrer or others concerning individual differences in the degree to which one or the other mode of learning dominates in facing old and new situations. Is the individual with a high Barrier score one in whom all "unnecessary" subcortical learning has been held to a minimum and in whom there has been a maximizing of learning involving the voluntary musculature? It would be interesting to determine if high Barrier score individuals differ from those with low Barrier scores in their susceptibility to the type of subcortical conditioning which has been demonstrated in humans (23).

Because high Barrier score *S*s showed a significantly more elevated level of aspiration in the TAT than did low Barrier score *S*s, the possibility arose that the body-image boundary concepts might be related to some of McClelland's (19) formulations concerning the achievement motive. McClelland[1] permitted a comparison of the n Achievement scores of thirty of his *S*s with Barrier scores derived from their Rorschachs. The Median Test indicated that there was a relationship significant at the .05 level between magnitude of n Achievement score and Barrier score. Those *S*s with the more armored boundaries tended to have the larger Achievement scores. These suggestive results have been recently indirectly confirmed by Aronson (2), who found that high n Achievement is significantly correlated .50 with the use of firm, well-individuated lines as against vague, blurry lines in the drawing of abstract designs presented tachistoscopically. One might paraphrase these results by saying that the higher the n Achievement score of an individual, the more likely he is to draw the boundaries of abstract designs as firm and definite. It is possible, then, that McClelland's achievement variable and the body-image boundary concept may lie close together on an important personality continuum of broader dimensions.

[1] We are very grateful to Dr. McClelland for the use of his data.

SUMMARY

In general, this study has shown that body-image concepts are meaningfully linked in a normal group with certain personality characteristics. It would appear that those who emphasize the armoring qualities of their body boundaries differ from those who do not in a greater interest in muscular expression, higher aspiration, a greater frequency of physical complaints involving the exterior layers of the body, and a tendency to perceive others as concealing their true intentions behind a deceptive facade. The individual who conceives of his exterior as armored seems to stress his own selfhood and its expression. It is possible that the definiteness of body boundaries may reflect the degree to which parental figures provided definite models after which to form a sense of self. Certain relationships have been pointed out between the body-boundary concept and Mowrer's two-factor learning theory, and McClelland's achievement variable. The body-image boundary variable may be representative of a fundamental personality dimension.

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PREDICTABILITY OF PERCEPTUAL DEFENSE BEHAVIOR[1]

BRUCE CARPENTER[2], MORTON WIENER, AND JANETH T. CARPENTER[2]

Central State Hospital, Indianapolis

THE "perceptual defense" controversy has been an area of considerable interest in recent years. Experimental data have been presented which both support (1, 5, 6, 19, 20) and question (11, 16, 17) the "perceptual defense" hypothesis.

Pertinent criticisms of the method used in much of the research on the "perceptual defense" phenomenon have been made by Lazarus (13) and by Eriksen (7). Eriksen has suggested that an adequate test of the perceptual defense hypothesis should involve a demonstration that the stimuli to be perceived are anxiety provoking for the individual *S* and that the *S*s have learned to deal with anxiety from this source by using particular avoidance defenses.

Several studies have been reported which appear to be a beginning in the direction of this more predictive approach (3, 4, 8, 9, 12, 14, 15). Lazarus, Eriksen, and Fonda (14) demonstrated that poor auditory perception of emotional material was characteristic of patients with hysterical personalities, while obsessive-compulsives showed better auditory perception of the material. However, Kurland (12) found negative results using similar *S*s (patients diagnosed as hysteric and as obsessive-compulsive) when tested with auditory stimuli. It would appear that the use of diagnostic categories leads to ambiguous or contradictory findings, so that a more refined method of selecting *S*s is indicated.

It has been suggested (2, 10, 12, 13) that an individual does not necessarily use the same defense mechanism in all anxiety-arousing situations, but that the defense mechanism may be specific to a particular area of conflict, or even that the defense mechanism may be specific to given aspects of a particular area of conflict. If this is true, then a more logical and systematic procedure in studying perceptual defense would be first to establish how an individual handles specific phases of conflictual material in a particular area and then to predict his recognition of perceptual stimuli related to this area. This procedure would avoid the criticisms of Lazarus and Eriksen, and in addition would recognize that a particular defense mechanism is not universal to any individual for all types of anxiety-producing stimuli.

If predictions of perceptual behavior can be made, this predictability would seem to be of considerable importance in resolving the perceptual defense controversy. The purpose of this study is to determine whether perceptual behavior can be predicted from knowledge of the particular mechanism of defense an individual uses for particular classes of stimuli (e.g., sex, hostility, and adequacy). The specific hypothesis to be tested is that individuals who use sensitizing or "alertness" defenses in a particular conflict area will more quickly perceive stimuli in that area than will individuals who use repressive or avoidant defenses in that area.

PROCEDURE

One hundred forty undergraduates in a beginning psychology course made up the pool from which the *S*s for this experiment were drawn. These 140 *S*s, as part of a larger study, were given a sentence-completion task with stems which were specially selected to elicit sex and hostility content. The sentence completions were judged by four clinical psychologists for indication of conflict and for the particular type of defense (repressive or sensitizing) used by the *S*. In judging the completed stems, the judges noted that certain responses indicated a preoccupation with feelings of inadequacy. It was decided to score the sentence completions for sensitization to inadequacy also.

Response classifications which were scored as repressive mechanisms were: blocking; avoidance; denial of stimulus implication; use of clichés; psychological removal from personal involvement; very limited generalizations; minimization of involvement in the conflictual activity; obligation, duty, imposed acceptability by authority; unelaborated definitions; and idealization, moralization, naiveté, and romanticization. Response classifications which were scored as sensitizer mechanisms were: preoccupation; projection; intellectualiza-

[1] This study was carried out as part of a larger project with the permission and encouragement of Clifford L. Williams, M.D., superintendent of Central State Hospital. Grateful acknowledgement is made to Dr. Charles C. Josey of Butler University for making his students available to serve as *S*s for this study. The authors wish to thank Mr. Austin Jones for serving as a judge for the selection criteria.

[2] Now at Florida State University.

tion; rationalization; statements of failure or inadequacy; undoing; use of humor with conflictual material; qualification; and overreaction to the stimulus.

A response could be scored: (*a*) without conflict; (*b*) hostility conflict—sensitizer; (*c*) hostility conflict—represser; (*d*) sex conflict—sensitizer; (*e*) sex conflict—represser; (*f*) adequacy conflict—sensitizer; (*g*) sensitizer response without designation of area of conflict; or (*h*) represser response without designation of area of conflict.

Agreement was defined as at least three of the four judges making the same judgment from the eight possible judgments. Agreement was established in this manner for 72 per cent of the 2,100 sentences judged. Only the sentences on which there was agreement among judges were used to select *S*s for this study.[3]

On these criteria, *S*s were selected who showed consistent use of either repressive or sensitizing mechanisms in the areas of sex or hostility, and presence or absence of sensitizing mechanisms in the area of adequacy. Six groups were established: (*a*) sex represser, (*b*) sex sensitizer, (*c*) hostility represser, (*d*) hostility sensitizer, (*e*) adequacy sensitizer, and (*f*) adequacy nonsensitizer. There were ten *S*s in each group, five men and five women. Several *S*s were in more than one group (e.g., sex sensitizer and hostility sensitizer). A total of 44 *S*s made up the experimental population.

All *S*s were given the perceptual task individually by one *E*. After the *E* had satisfied himself that the *S* understood the procedure, the *S* was shown a series of booklets, each booklet consisting of 20 carbon copies of a single typed word (in capital letters). The 20 carbon copies of the word were arranged in order from the least clear to the most clear copy. This technique has been described more fully elsewhere (5, 18, 19). The critical words for the sex area were petting, necking, sexual, and kissing; for the hostility area, hate, anger, argue and fight; and for the adequacy area, fail, inferior, inadequate, and flunk. All *S*s were first given trials on the control words, table and lamp, after which they were given at least six booklets to decipher, four of which were critical for the *S* and two of which were buffer words. The buffer words, used to reduce the possibility of the *S*'s establishing a set for words in the conflict area being tested, were selected randomly from words in the other areas. For those *S*s who were in more than one experimental group, the critical words for the different areas were administered randomly without use of extra buffer words. The *S*s were not permitted to spend more than five seconds on any given copy of any word. The *E* recorded the number of pages required for correct identification of each word. Guessing was encouraged and all responses were noted.

Each *S*'s score was the average number of pages required to identify correctly the four critical words less the average number of pages required to identify correctly the control words. This difference score was used to test the hypothesis that sensitizers require less adequate cues than repressers to perceive conflict words correctly, when differences in perceptual ability are controlled.

[3] An article describing the development and use of this criterion measure is in press (*J. consult. Psychol.*, 1956).

RESULTS

The difference scores of sex sensitizers were compared with those of sex repressers, the difference scores of hostility sensitizers with those of hostility repressers, and those of adequacy sensitizers with adequacy nonsensitizers. The differences between means were tested by *t* tests.

Table 1 shows the means and standard deviations for the control words, for the critical words, and for the difference scores; also shown are the probability values for the differences between the means of the difference scores for the three areas—sex, hostility, and adequacy. The differences between the means of the control words for the three areas are not significant. In the comparisons between the difference scores, one-tailed tests of significance were used. In respect to the particular hypothesis being tested, its theoretical context, and previous experimental evidence, differences in the unexpected direction may be treated as equivalent to the absence of differences.

The differences between the sex sensitizers and the sex repressers ($p < .04$), and between the hostility sensitizers and the hostility repressers ($p < .01$) are significant. The difference between the adequacy sensitizers and the adequacy nonsensitizers ($p < .30$) fails to reach the arbitrary level of significance established, but is in the expected direction.

TABLE 1

PERCEPTUAL SENSITIVITY TO CONTROL WORDS AND TO CRITICAL WORDS IN THREE CONTENT AREAS IN RELATION TO PREFERRED DEFENSE

($N = 10$ for each of the six groups)

Group	Control Words		Critical Words		Difference Scores			
	Mean	*SD*	Mean	*SD*	Mean	*SD*	*t*	*p*
Sex								
Sensitizer	10.35	2.14	11.22	1.31	.88	1.85	1.90	<.04
Represser	8.85	3.35	11.78	1.27	2.92	2.64		
Hostility								
Sensitizer	10.75	2.27	11.30	2.57	.55	2.47	2.70	<.01
Represser	9.00	3.38	13.00	1.48	4.00	2.93		
Adequacy								
Sensitizer	10.60	3.05	12.75	1.20	2.15	3.00	.62	<.30
Nonsensitizer	9.55	3.85	12.70	.92	3.15	3.79		

NOTE.—Correct perception on the basis of minimal cues yields a *low* score. See text.

DISCUSSION

The observed difference between sensitizers and repressers clearly supports the hypothesis that perceptual defense behavior occurs and can be predicted. The methodological criticisms by Lazarus and Eriksen of some of the previous research in this area seem even more pertinent in light of the findings of this experiment. To demonstrate perceptual defense it seems essential to show that a particular class of stimuli is anxiety provoking for the individual *S* and to recognize the particular mechanism with which the individual has learned to deal with the anxiety-provoking material.

The difference between the sensitizers and nonsensitizers in the area of adequacy failed to reach significance. The most likely explanation for this lies in the selection criteria. The original development of the criterion measure did not include stems designed to elicit mechanisms for handling adequacy, in contrast to the sex and hostility areas. Rather, adequacy responses were apparently spontaneously elicited by the other stems and were thus scorable only as sensitizing or as not present. Thus the likelihood of false positives among the adequacy nonsensitizers seems higher than among the other groups.

Although it is evident that the college students who were *S*s in this experiment have areas of conflict and particular mechanisms of defense for dealing with these areas of conflict, it is unlikely that either conflicts or defenses are so intense or extensive as to be pathological. In addition, the use of relatively mild stimulus words, such as kissing or fight, rather than more intense words, would be expected to minimize differences between groups. Positive findings under such circumstances would seem to enhance the significance of the results as support for the perceptual defense hypothesis.

Attempts to explain these data by the "more parsimonious" interpretations of word frequency, inhibition of report, and set do not seem adequate. In this experimental design, both groups were tested on the identical words, eliminating the effect of word frequency. Any set or inhibition of report would be expected to operate equally for both groups. Should there have been set or inhibition of report operating for one group and not the other, then this would have been of some significance as well. However, examination of the number and kind of guesses made by each group indicates that there was no apparent difference between the groups in set or inhibition. There were no significant differences between the sensitizers and repressers in the relative proportion of guesses or the content of the guesses. Perceptual defense would seem to be the most parsimonious explanation of the data.

SUMMARY

This study was designed to demonstrate that perceptual behavior can be predicted from knowledge of the particular mechanism of defense an individual uses for particular classes of stimuli. When *S*s were selected as using repressive or sensitizing mechanisms in particular conflict areas, it was found, as predicted, that sensitizers were significantly faster in perceiving conflict words than were repressers.

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POSTDECISION CHANGES IN THE DESIRABILITY OF ALTERNATIVES[1]

JACK W. BREHM[2]
University of Minnesota

THE importance of the choice situation is reflected in the considerable amount of theory and research on conflict. Conflict theory has generally dealt, however, with the phenomena that lead up to the choice. What happens after the choice has received little attention. The present paper is concerned with some of the consequences of making a choice.

Previous consideration of the consequences of choice have been limited to relatively unspecified hypotheses (1, 3) or to qualitative analysis (4). However, a recent theory by Festinger (2) makes possible several explicit predictions. According to this analysis of the choice situation, all cognitive elements (items of information) that favor the chosen alternative are "consonant," and all cognitive elements that favor the unchosen alternative are "dissonant" with the choice behavior. Furthermore, other things being equal, the greater the number of elements favoring the unchosen alternative (i.e., the greater the relative attractiveness of the unchosen alternative) the greater the resulting "dissonance." When "dissonance" exists, the person will attempt to eliminate or reduce it. Although space limitations preclude further discussion of the theory, it may be said that several derivations are possible concerning the consequences of making a choice. The present study was designed to test the following:

1. Choosing between two alternatives creates dissonance and a consequent pressure to reduce it. The dissonance is reduced by making the chosen alternative more desirable and the unchosen alternative less desirable after the choice than they were before it.

2. The magnitude of the dissonance and the consequent pressure to reduce it are greater the more closely the alternatives approach equal desirability.

3. Exposing a person to new relevant cognitive elements, at least some of which are consonant, facilitates the reduction of dissonance.

[1] This paper is based on a thesis offered in partial fulfillment of the requirements for the Ph.D. degree at the University of Minnesota. The author wishes to thank his advisor, Dr. Leon Festinger, for his invaluable aid in the formulation and execution of the study. He also wishes to thank the Laboratory for Research in Social Relations, which supported the study.

[2] The author is now in the Department of Psychology, Yale University.

METHOD

In order to test these hypotheses, a procedure was required in which each subject would: (*a*) rate each of a variety of objects on desirability, (*b*) choose between two of the objects rated, and (*c*) rate the desirability of each object again. Also, the extent to which the choice alternatives approached equal desirability had to be subject to control.

These requirements were met in the following way. The *S*s were asked, in the context of consumer research, to rate the desirability of each of eight manufactured articles. As payment for taking part in the research, each *S* was given a choice between two of the rated articles. After the *S* had made his choice, and with the objects then out of sight, he was asked to rate each again. Thus a measure of change in desirability was available for the chosen and unchosen alternatives, and for articles not involved in the choice.

Design and Procedure

Subjects and rationale. The *S*s consisted of 225 female students, mostly sophomores, from elementary psychology classes at the University of Minnesota. The initial instructions were designed to convince *S* that she deserved, and would receive, payment for participating. Thus, *S* was told that: (*a*) the task was contract work for several manufacturers rather than a regular psychological experiment; (*b*) the experimenter and professor in charge were profiting substantially from the project; (*c*) the *S* herself was being asked to spend several more hours on the project; (*d*) for participation she would receive a product of one of the manufacturers.

The objects. After *S* agreed to participate, it was explained that there were eight manufactured articles, each of which was to be rated as to its desirability. Each object was then taken out of its box, briefly described, and shown to *S*.

The objects were new-looking and made by different manufacturers. They ranged in retail value from about $15 to about $30. They consisted of the following: an automatic coffee-maker, an electric sandwich grill, a silk-screen reproduction, an automatic toaster, a fluorescent desk lamp, a book of art reproductions, a stop watch, and a portable radio.

The rating scale. Objects were rated by marking a continuous line on which eight identifying points were spaced equally. These points were accompanied by written statements from "extremely desirable" to "defi-

nitely not at all desirable." All eight scales appeared side by side on the same sheet.

After the eight objects had been placed on a table in front of *S*, *E* explained the rating procedure. It was stressed that desirability meant the net usefulness of the object after one had taken into consideration not only its attractiveness and quality but also how much the *S* herself needed such an article. When it was clear to *S* how to rate, she was encouraged to inspect each article carefully and to take as much time as she liked in rating. The *S*s spent from 5 to 20 minutes inspecting and rating. Most *S*s spent about 15 minutes.

The choice. When *S* had finished rating the objects, *E* explained the method of payment. He said that *S* was to get one of the eight objects she had just rated, but because *S*s would tend to choose the more attractive objects and there weren't enough to go around, the choice would be limited. In order to be fair to everyone a list of pairs of objects had been made up and each *S* was given a choice between the two objects of a pair picked at random. The *E* then pretended to look at a schedule to see which two objects *S* could choose between. In actuality, the objects offered for choice were determined by the degree of dissonance to be created, as is explained below. The *E* then told *S* which two objects she could choose between. As soon as *S* indicated her choice, the chosen object was put back in its box, the box was closed, securely tied with string, and put with whatever personal belongings *S* had with her. This routine was designed to convince *S* that she was getting the article.

The manipulation of dissonance. The two objects offered for *S*'s choice were picked in the following manner. One was always an article that had been rated fairly high in desirability, i.e., at about 5, 6, or 7 on the 8-point scale (where 8 represents "extremely desirable"). To create high dissonance (High Diss condition), the other object was always nearly as desirable as the first, i.e., only ½ to 1½ scale-points lower. For medium dissonance (Med Diss) the alternative was always about 2 scale-points lower, and for low dissonance (Low Diss) the alternative was always about 3 scale-points lower in desirability.[3] If an *S*'s ratings were such that the predetermined condition could not be created, an alternative condition was used, or, if that was not possible, the *S* was discarded.

One control condition (Gift condition) was included to determine the effect on change in desirability ratings of being given one of the objects without having to choose between two. In this condition *E* explained that to keep from running out of any one article, *S* would get one that had been randomly determined previously. As with a chosen object, the gift object was put in its box, tied with string, and put with *S*'s personal belongings. The gift item was always picked to correspond in desirability rating with the first of the choice articles, i.e., with a rating of about 5, 6, or 7 on the scale.

Providing new information. After *S*'s chosen or gift item had been put with her things, *E* explained that four of the manufacturers were interested in finding out what strikes people as being good or bad about their products. To accomplish this they had given samples of their products to an independent research organization to have an objective appraisal made of each product. The *E* then said that he wanted *S* to read the research report for each of these four products, and when she had finished he would ask her what struck her as being good or bad about each, and also which comments would be good for advertising the product. He then took four fictitious research reports from a folder and handed them to *S*. While *S* read, *E* put away the remaining seven objects.

Each "research report" was on a separate sheet and consisted of a short paragraph of supposedly factual material stating two or three good and two or three bad points about the object. For example, the report for the grill read as follows: "This grill is versatile, grills toast, sandwiches, hot dogs, frozen waffles, etc. Waffle plates may easily be attached (cord and optional waffle plates are not supplied, these require additional purchases). The grill plates may be damaged if kept heated too long (7 or 8 min.) in closed position. The heat indicator dial fluctuates, usually underestimating amount of heat. The other surface is durable, easy to clean, won't rust."

For about half the *S*s in both the High and Low Diss conditions, the four research reports included the choice alternatives, and for all other *S*s, they did not include the choice alternatives. In the Gift condition, the four research reports always included the gift item. Those conditions in which the research reports included the alternatives will be referred to as Info (Information) and the remaining will be referred to as No Info.

The second rating. After *S* had finished answering questions about the research reports, *E* said that the manufacturers were interested in finding out how evaluations of their products changed after a person had looked them over and then left the store. To do this, it was necessary to rate each object again now that *S* had looked them over and they were all out of sight. The *S* was asked to reconsider each item carefully and then rate each in the same manner as the first time. To minimize the effects of memory for the first ratings, the second rating scales were given one at a time instead of all on one sheet.

Upon completion of the second rating, the experiment was fully explained. Only two or three of all the participants showed resentment at not getting the object. With these *E* went into more detail about the reasons for designing such an experiment.

Assignment of Ss to experimental conditions. Within the limits of availability, *S*s were scheduled and assigned to the different conditions at random. Order of assignment was varied so as to cancel out differences due to change in the effectiveness of *E* with time and practice. There were 27 *S*s in each of the High Diss conditions, 33 in Low Diss—No Info, 30 in Low Diss—Info, and 30 in the Gift condition. In addition, there were 48 who chose the object initially rated lower, and were therefore eliminated from consideration.[4]

[3] Since preliminary analysis revealed no reliable differences between the Med and Low Diss conditions, they were combined and called Low Diss.

[4] Analysis of these data showed that their deletion could not account for the main experimental results. Indeed, the changes in desirability were, if anything, in the direction of reducing dissonance.

RESULTS AND DISCUSSION

Scoring the Desirability Ratings

It will be remembered that each object was rated, both before and after the choice, on a scale of desirability. These ratings were assigned numerical values corresponding to their linear position on the scale, with 1.0 representing "not at all desirable," and 8.0 representing "extremely desirable." The values were found to the closest tenth of an interval.

Any change in desirability of an object could then be found by comparing values of the first and second ratings. A difference between these values was marked positive if it indicated an increase in desirability, and negative if it indicated a decrease. However, since reduction of dissonance may be accomplished either by raising the desirability of the chosen, or lowering the desirability of the unchosen object, change in dissonance was measured by the algebraic difference in change of ratings between chosen and unchosen objects.

Since ratings are less than perfectly reliable, some of the change from first to second rating must be attributed to regression effects, which should be greater in the case of initial ratings near the ends of the scale than for those near the middle. So as to correct for regression, first and second ratings of all objects not involved in a choice (or as a gift) were correlated separately for objects for which information was given and for objects for which information was not given. Prediction equations were then used to determine the expected amount of regression for any given initial rating.[5] To estimate the true change in desirability, the expected regression was algebraically subtracted from the actual change in rating. If, for example, a person's rating of the chosen article did not change, but the expected regression was a decrease of .20, then the net change in desirability was considered an increase of .20. Rating changes altered in this manner will be referred to as *corrected rating changes*. The measure of primary interest is the Corrected Change in Dissonance. Both corrected and uncorrected mean rating changes for the chosen and unchosen objects, as well as the corrected and uncorrected Change in Dissonance, are presented in Table 1. Rating changes which were found by *t* test to be significantly different from zero are starred.

TABLE 1

MEANS OF INITIAL RATINGS, RATING CHANGES, EXPECTED REGRESSION AND CORRECTED RATING CHANGES

	N	In Choice		Not in Choice	Corrected Rating Change
		Initial rating	Rating change	Regression (N = 357)	
No Information					
Low dissonance					
Chosen	33	5.98	.33*	−.05	.38*
Unchosen	33	3.54	−.14	.10	−.24
Change in dissonance†			−.47	+.15	−.62*
High dissonance					
Chosen	27	6.19	.20	−.06	.26
Unchosen	27	5.23	−.66**	.00	−.66**
Change in dissonance			−.86**	+.06	−.92**
Information					
				(N = 334)	
Low dissonance					
Chosen	30	6.00	−.30	−.41	.11
Unchosen	30	3.47	.07	.07	.00
Change in dissonance			+.37	+.48	−.11
High dissonance					
Chosen	27	6.05	−.04	−.42	.38*
Unchosen	27	5.07	−.64**	−.23	−.41*
Change in dissonance			−.60*	+.19	−.79**
Gift condition	30	5.91	−.40**	−.40	.00

* Significantly different from zero at the .05 level.
** Significantly different from zero at the .01 level.
† A minus sign indicates decrease in dissonance.

Changes in Desirability Ratings

The effect of the amount of dissonance. According to Hypothesis 1, making a choice creates dissonance and a consequent pressure to

[5] The obtained correlation coefficients were, for objects without information, .95, and for objects with, .89. The mean rating changes were .05 and −.07, respectively. This method of estimating regression assumes that it is linear throughout the scale. Comparison of actual mean regression calculated from individual scale intervals with those obtained from the prediction equations indicates a slight flattening of regression in the lower part of the scale. However, estimates of regression for the chosen and unchosen alternatives computed from individual scale intervals yield essentially the same results as estimates obtained from the product-moment correlation.

re-evaluate the alternatives in order to reduce the dissonance. Examination of Corrected Change in Dissonance scores in Table 1 reveals a significant reduction of dissonance in all but the Low Diss-Info condition. It may also be noted that reduction of dissonance is accomplished both by raising the desirability of the chosen alternative and by lowering the desirability of the unchosen alternative.

According to Hypothesis 2, the magnitude of the dissonance and consequent pressure to reduce it is greater the more closely the alternatives approach equal desirability. Thus the reduction of dissonance should be greater in the High than in the Low Diss conditions. Data in Table 1 further indicate that in the No Info condition the Corrected Change in Dissonance for High Diss (−.92) shows greater reduction than that for Low Diss (−.62), though the difference is not statistically significant. In the Info condition the Corrected Change score for High Diss (−.79) shows greater reduction than that for Low (−.11) and is significant at the 5 per cent level of confidence. Thus, the data clearly support Hypothesis 2.

The effect of new cognitive elements. According to Hypothesis 3, exposing a person to new relevant cognitive elements, at least some of which are consonant, facilitates the reduction of dissonance. The magnitude of the reduction should therefore be greater in the Info than in the No Info condition.

It will be noted from Table 1 that the Corrected Change in Dissonance scores show no greater reduction of dissonance in the Info than in the No Info conditions. In fact, the amount in High Diss-No Info is greater than that in High Diss-Info, and similarly, that in Low Diss-No Info is greater than that in Low Diss-Info, though neither of these differences is significant. The expectation that there would be greater reduction of dissonance in the Info than in the No Info condition is, therefore, not supported.

The second expectation concerning the effect of new cognitive elements was that the difference in reduction of dissonance between High and Low Diss conditions would be greater in the Info than in the No Info condition. It will be observed in Table 1 that the difference in Corrected Change in Dissonance between High and Low Diss in the No Info condition (.30) is not significant, while the same difference in the Info condition (.68) is significant at the 5 per cent level. However, the second-order difference for the Info and No Info conditions is not statistically significant. Thus, the expectation that there would be a greater difference in reduction of dissonance between High and Low Diss conditions in the Info condition is supported only by trends in the data.

The effect of ownership. Previous studies have found that when a person is given an object he tends subsequently to see it as more desirable. This may be called the effect of ownership. The present results may perhaps be regarded as simply a reflection of this phenomenon. The Corrected Rating Changes for the *unchosen* alternative in each experimental condition provide pertinent data. It is clear that changes in desirability of the unchosen alternative are due to choice rather than ownership. In Table 1 it may be seen that the Corrected Rating Changes of the unchosen object in the Low Diss conditions are for No Info, −.24 and for Info, .00, neither of which is a significant change. For the High Diss conditions these figures are −.66 and −.41, respectively, and are statistically significant. It is therefore evident that desirability ratings of the unchosen alternative not only show a decrease, but also reflect the difference between High and Low Diss conditions in the pressure to reduce dissonance. At least this part of the present results is thus not attributable to ownership.

It still might be true, however, that part or all of the gain in desirability of the *chosen* alternative is due to ownership rather than choice. To check this possibility, some *S*s were simply given an object that corresponded in initial rating to the chosen alternative of the choice conditions. If the effect of ownership were to account for any part of the gain in desirability of the chosen alternative, then this gift object should also increase in desirability. The row labeled "Gift" in Table 1 presents the mean changes in desirability ratings for this condition. It is clear from the Corrected Rating Change of .00 that none of the gain in desirability of the chosen alternative may be attributed to the effect of ownership.

Changes in desirability and avoidance of conflict. A plausible alternative interpretation of the various desirability changes so far reported should be considered. According to this view

a person tends to avoid conflict as unpleasant. Thus, if equally desirable alternatives are offered, conflict is created, leading to attempts to reduce it. It is clear that the conflict could be reduced by changing the desirability of the alternatives in order to make them less equal in desirability. One would expect the chosen alternative to increase and the unchosen alternative to decrease in desirability. Furthermore, these changes would be proportional to the amount of conflict, which in turn would vary with the equality of desirability of the alternatives. Consequently, one would expect greater changes in the High Diss conditions than in the Low Diss conditions. The predictions are so far consistent with the obtained results.

However, there is an interesting distinction between "the consequences of avoidance of conflict" and "reduction of dissonance." The amount of dissonance is a direct function of the proportion of relevant elements which are dissonant. It follows that the amount of dissonance is limited by the proportion of relevant elements which are common to the alternatives. If all relevant elements are contained by both alternatives, no dissonance is created by a choice between them. For example, choosing between identical automobiles would create little or no dissonance. Thus it may be said that, other things being equal, the greater the amount of overlap of cognitive elements, the less is the resulting dissonance. But conflict arises from an inability to determine which alternative to choose, i.e., from approximately equal tendencies to choose both alternatives. Increasing the similarity of the choice objects will not necessarily increase a person's ability to choose between them. While conflict remains high, dissonance created by making the choice would be relatively low.

In the course of the experiment 30 *S*s were inadvertently given a choice between relatively similar objects, and the data for this type of choice were analyzed separately.[6] The choices designated as having large overlap of cognitive elements were the following: a choice between any two of the coffee-maker, the toaster, and the grill; or a choice between the art book and the silk-screen reproduction. The changes in desirability from this type of choice may then be compared with those from the regular experimental choices, which had less cognitive overlap. But first it will be pertinent to examine data relevant to the amount of conflict experienced by persons having these two types of choice.

TABLE 2

MEAN RATING CHANGES (IGNORING REGRESSION) FOR ALTERNATIVES WITH COGNITIVE OVERLAP

	No Info	Info
Low Diss		
N	8	11
Chosen	.37	−.14
Unchosen	1.26	.79
Change in dissonance†	+.89	+.93
High Diss		
N	7	4
Chosen	.59	−.70
Unchosen	.00	−.25
Change in dissonance	−.59	+.45

† A minus sign indicates decrease in dissonance.

All *S*s were asked, after the experiment was completed, if there was any conflict in making the choice, and if so, how much. Their responses were categorized by the experimenter as "none," "little," "moderate," or "high."[7] To obtain category frequencies large enough for a chi-square test, the categories were reduced to two: "none" and "some" reported conflict. It was then found that of all subjects who had a high dissonance choice, 63 per cent of those choosing between alternatives without cognitive overlap and 88 per cent of those choosing between alternatives with cognitive overlap, reported "some" conflict. This difference is significant at the 6 per cent level by chi square. Of those who had a low dissonance choice, 47 per cent of those choosing between alternatives without overlap, and 25 per cent of those choosing between alternatives with overlap, report "some" conflict. The latter relationship is in the opposite direction to the first but is not statistically significant. It may be concluded that those who choose between nearly equally desirable objects with large overlap of cognitive elements experience more conflict than those choosing between dissimilar

[6] The author is indebted to Dr. Festinger, who first noted this difference.

[7] The classification by *E*, who knew whether or not the alternatives were nearly equal in desirability, may well be biased in respect to the High versus Low Diss manipulation. However, *E* did not expect to separate out choices involving cognitive overlap so there is no reason to suspect a bias in regard to this variable.

objects. If the changes in desirability in this experiment are due to avoidance of conflict, then, one would expect *greater* changes where the alternatives are similar. On the other hand, if the changes are due to a pressure to reduce dissonance, one would expect them to be *less* where the alternatives are similar.

In Table 2 may be found the uncorrected mean changes in desirability ratings for the chosen and unchosen alternatives which had cognitive overlap. These may be compared with the uncorrected rating changes in Table 1. Corrections for regression are not necessary since the important comparisons are between the two High Diss conditions and between the two Low Diss conditions. It will be seen that the changes in the direction of reducing dissonance (or avoiding conflict) are small or nonexistent. For all those with a high dissonance choice, 27 per cent of those choosing between similar and 59 per cent of those choosing between dissimilar alternatives show rating changes in the direction of reducing dissonance or avoiding conflict. This difference is significant, by an exact test, at the 11 per cent level. There is thus some evidence that choices between alternatives with overlapping cognitive elements create less tendency to change the desirability of the alternatives in the expected direction. Since it has already been seen that such choices are accompanied by more, rather than less, conflict, it appears that these changes in desirability reflect reduction of dissonance rather than avoidance of conflict.

SUMMARY AND CONCLUSIONS

The present experiment was designed to examine some of the consequences of making a decision. Specific predictions about the consequences were based on a theory by Festinger. According to this theory, when a person chooses one of two alternatives, all of the items of information which favor the unchosen alternative will be dissonant. Thus a state of dissonance and pressure to reduce it are created. Examination of the possible ways in which dissonance may be reduced was limited in the present study to tendencies to re-evaluate the choice alternatives after the decision.

Female *S*s were asked to rate each of eight articles on desirability, choose between two of them, and then rate each of the articles again. In addition, some *S*s were exposed to a mixture of good and bad information about the choice alternatives after the choice was made.

The results supported the prediction that choosing between alternatives would create dissonance and attempts to reduce it by making the chosen alternative more desirable and the unchosen alternative less desirable. A second prediction, that dissonance and consequent attempts to reduce it would be greater the more nearly the choice alternatives approached equality, also received support. The third prediction, that exposure to new information containing at least some consonant elements would facilitate reducing dissonance, did not receive clear support. A control condition ruled out the possibility that the obtained increase in desirability of the chosen alternative was due to ownership. Finally, some of the data consistent with "dissonance theory" were found not to be consistent with traditional "conflict theory."

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THE MEASUREMENT OF OVERT AGGRESSION FROM FANTASY[1]

JEROME KAGAN

The Ohio State University

ALTHOUGH the relation between overt and fantasy aggression has been the subject of much research the results have been varied and sometimes contradictory. Korner (2), studying preschool children, found no relation between frequency of overt aggressive acts and occurrence of fantasy aggressive themes during doll-play sessions. However, separate studies by Bach (1) and Sears (7) indicate that children rated at both extremes on display of overt aggression, i.e., very aggressive or very nonaggressive, produced more doll-play themes of aggression than children who were rated as only moderately aggressive. Independent investigations by Murray (3), Pittluck (5), and Sanford *et al.* (6), on middle-class populations, all failed to find a significant relation between frequency of aggressive TAT themes and behavior ratings of overt aggression. Mussen and Naylor (4), however, did find a significant positive relation between ratings of overt aggression and number of TAT aggressive themes for a group of lower-class delinquent boys. The authors argued that overt aggression is subject to less punishment in lower-class families than in middle-class ones. Therefore, lower-class *S*s should be less anxious over behaving aggressively and be less apt to inhibit overt behavior in response to aggressive motivation. Thus aggressive fantasy, which is a possible index of aggressive motivation, should be more predictive of overt aggression for lower- than for middle-class *S*s.

The lack of agreement among existing findings might be due, in part, to a failure to consider two aspects of the fantasy material. The first concerns the ambiguity of the stimulus which elicits the fantasy. The major techniques for obtaining fantasy, i.e., TAT and doll play, confront the *S* with an ambiguous stimulus. It is assumed that interpretations of such stimuli are a measure of the individual's motives. Since aggressive activity is generally punished and prohibited, however, in order to predict the occurrence of overt aggression one must measure not only the strength of the individual's aggressive drive but also the amount of anxiety and inhibition associated with the overt expression of aggressive activity.

Stories told to stimuli that suggest aggressive content may provide a measure of an individual's anxiety over aggressive behavior. That is, if an individual does not report an aggressive theme to a stimulus which regularly elicits aggressive content one might assume that anxiety over aggression has led to inhibition of an aggressive interpretation. It is assumed that such an *S* is apt to inhibit overt aggressive acts in other interpersonal situations as well. Failure to produce aggressive themes to stimuli that do not regularly elicit aggressive content is probably a less sensitive index of the strength of these inhibitory responses. Such an approach is supported by Pittluck's (5) findings, which indicate the value of assessing the amount of anxiety associated with aggression in order to predict its occurrence. Although she failed to find a relation between frequency of aggressive TAT themes and overt aggression, prediction of overt aggression improved significantly when statements suggesting anxiety over aggression (excusing, denial, or noncompletion of the aggressive theme) were taken into account.

Prediction may also be improved by narrowing the categories of overt and fantasy behavior that are correlated. In some studies the index of fantasy aggression includes a wide variety of behaviors (killing, fighting, suicide, anger, destruction, stealing, swearing, etc.) and there is often no differentiation with respect to the person toward whom the aggression is directed. This complex and undifferentiated index of aggressive fantasy is then correlated with categories of overt behavior that tend to be more restricted in goal object and mode of expression. Thus, although Bach (1) did not find a significant relation between overt aggression in a school situation and a complex index of doll-play aggression, he did find a direct relation between overt and doll-play aggression directed at the teacher. When the

[1] The author wishes to thank Dr. Julian B. Rotter for his critical comments on the manuscript and Mr. W. Katkofsky and Mr. K. Anderson for assistance with the study.

overt and fantasy behaviors were similar in goal object, a significant relationship emerged.

This study concerns the relation between frequency of fighting behavior among young boys and the stories told to a set of pictures that varied in ambiguity with respect to themes of fighting. On the basis of the previous discussion one might hypothesize that (*a*) frequency of fighting themes is more directly related than other types of fantasy aggression to overt fighting behavior and (*b*) pictures suggesting aggressive content are more predictive of overt aggression than more ambiguous pictures.

PROCEDURE

The *S*s were 118 boys drawn from seven classes (grades one through three) in a Columbus, Ohio, public school. Their ages ranged from 6-1 to 10-2 with a median age of 7-9. The school population was predominantly middle class, the majority of the fathers being skilled laborers and tradesmen. Before initiating individual interviews with each *S* the *E* spent several hours with each of the seven classes in order to become familiar with the children.

After some introductory games had served to establish rapport in the interview situation, the *E* introduced the fantasy task with the following communication:

> Let's play a guessing game now. I have some pictures here and I want you to guess what's happening on the picture. You have to make up a story to tell what you think is going on in the picture.

Thirteen pictures were administered, four of which depicted interactions between two or more boys. The pictures, in the order of their presentation, were as follows:

1. Four boys are in a circle around a baseball bat and, off to one side, a boy is tossing a closed penknife in the air.
2. A boy is sitting on a chair holding a broken shoe lace and a woman is standing in the background.
3. One boy is running behind a second boy in the street.
4. A crying boy is sitting on the floor and a woman, standing behind the boy, is looking down at him.
5. A boy with bowed head is standing near a bicycle which is turned over. A man is looking down at the boy.
6. A boy is stamping on an ambiguous object and a second boy is reaching toward the object.
7. A boy with bowed head is approaching a man sitting in a chair.
8. A boy with clenched fists is staring at a second boy who is sitting, head bowed, on a wooden box.
9. A boy is walking away from a woman who has her hands over mouth.
10. A boy is holding his hand out to a man who is standing with one hand in his pocket.
11. A boy is crying and a woman is bending over the boy.
12. A boy with a cut on his arm is crying and a woman is standing in the background with her back to the boy.
13. A boy is crying and a man is standing in back of the boy looking down at him.

Each *S* was rated by one person, his teacher, on the following behaviors: (*a*) tendency to start fights at the slightest provocation and (*b*) tendency to hold in his anger and not to express it overtly. The ratings were made on a five-point scale, the lowest rating defined to the teachers as, "A very low tendency to behave in this fashion. The child is hardly ever like this." The highest rating was defined as, "A very high tendency to behave in this fashion. The child is very often like this."

These two behaviors were selected in order to obtain a check on the consistency of the ratings. It was assumed that an *S* with a low rating on Variable *a*, i.e. never starts fights, would receive a high rating on Variable *b*, i.e. always holds in his anger. If the raters were consistent there should be a high negative correlation between the ratings on these two variables. The product-moment correlation was −.94.

On the basis of the ratings the sample of 118 was divided into five groups differing in degree of overt aggression. The three most aggressive and the three least aggressive *S*s in each class were selected to make up two extreme groups of 21 boys each (Groups A and NA). The remaining *S*s were divided into those rated frequently aggressive (Group FA), moderately aggressive (Group MA), and infrequently aggressive (Group IA).

The stories were scored for a variety of themes but those relevant for this paper are (*a*) fighting between boys, (*b*) destruction of property, (*c*) stealing, (*d*) swearing, and (*e*) physical aggression to an adult. The stories were scored independently by *E* and a graduate student in psychology without knowledge of the behavior ratings. Percentage of agreement was high for each type of theme and the over-all percentage of agreement was 98 per cent.

RESULTS

The occurrence of themes involving fighting between boys (F themes) was almost exclusively restricted to the four pictures illustrating boy–boy interactions (pictures 1, 3, 6, and 8).

TABLE 1

FREQUENCY OF FIGHTING (F) THEMES PRODUCED BY GROUPS RATED DIFFERENTLY ON AGGRESSIVE BEHAVIOR

Group	*N*	Degree of aggression	Percentage of group with one or more F themes	Mean number of F themes per group
A	21	Very aggressive	100.0	2.62
FA	17	Frequently aggressive	94.1	2.23
MA	34	Moderately aggressive	79.4	1.64
IA	25	Infrequently aggressive	96.0	1.76
NA	21	Very non-aggressive	81.0	1.52

Table 1 shows the percentage of *S*s in each group who reported one or more F themes for the 13 pictures and the mean number of F themes for each group. The difference between Groups A and NA in regard to the percentage producing F themes was not statistically significant but was in the predicted direction ($.10 > p > .05$). All p values are for one tail. The mean number of F themes for Group A was greater than that of Group NA ($p < .01$), however, and the pooled mean for Groups A and FA was larger than the pooled mean for Groups NA and IA ($p < .01$).

The remaining four categories of fantasy aggression were not produced as frequently as were themes of fighting. When stories containing destruction, stealing, swearing, and physical aggression to adults are pooled for all 13 pictures there are no significant differences among the groups in percentage producing any one of these content categories or in mean number of these themes produced. Thus, with this set of stimuli, only F themes were significantly related to ratings of fighting behavior.

Group A produced more of these nonfighting, aggressive themes, nevertheless, than did any of the remaining groups. Perhaps if some of the pictures had been more suggestive of stealing or swearing these fantasy categories might have differentiated between the aggressive and nonaggressive subjects.

The ambiguity of the pictures was determined by having graduate students judge the four pictures illustrating boy–boy interactions (1, 3, 6, and 8) with respect to the degree to which each suggested a fighting theme. Picture 1 was judged the least suggestive, Picture 8 the most suggestive. Pictures 3 and 6 were judged moderately suggestive with the former slightly more ambiguous as regards aggressive content. Table 2 shows the proportion of each group producing F themes to each of the four pictures.

TABLE 2

FREQUENCY OF FIGHTING (F) THEMES IN RELATION TO STIMULUS AMBIGUITY AND RATED BEHAVIORAL AGGRESSIVENESS

Picture	Degree of Ambiguity	Percentage Producing F Themes					
		Group A	Group FA	Group MA	Group IA	Group NA	All groups
1	Most ambiguous	28.6	35.3	44.1	32.0	23.8	32.8
3	Moderately ambiguous	66.7	41.2	32.4	16.0	28.6	37.0
6	Moderately ambiguous	42.9	47.1	35.3	40.0	42.9	41.6
8	Least ambiguous	95.2	88.2	52.9	80.0	57.1	74.7

The data indicate a general increase in the occurrence of F themes with decreasing ambiguity of the pictures. However, more of the *S*s in Group A, as compared with Group NA, produced F themes to the picture most suggestive of fighting ($p < .01$). There was no marked difference between Groups A and NA in proportion giving F themes to the picture least suggestive of aggression. Furthermore, the difference between Groups A and NA on the most suggestive picture was larger than the difference between these two groups on the least suggestive picture ($p = .07$). The significance of this second order difference suggests that interpretations of stimuli suggestive of fighting may be more predictive of overt aggression than the interpretations of more ambiguous stimuli.

DISCUSSION

The results tend to verify the hypothesis of a direct and positive relation between fighting behavior in fantasy and overt expression when the stimuli used to elicit the fantasy suggest aggressive content. If an individual responds with strong anxiety to aggressive thoughts, then a picture that suggests aggressive activity is apt to elicit sufficient anxiety to motivate responses that inhibit the reporting of aggressive stories. The *S* who associates less anxiety with aggression is more likely to report an aggressive theme when confronted with a picture that suggests this type of content. Thus, failure to tell aggressive stories to stimuli that regularly elicit such themes may be regarded as a measure of the amount of anxiety associated with the expression of aggressive thoughts. Prediction of overt aggression from fantasy themes is based on the assumption that an *S* who is anxious about telling aggressive stories to a psychologist will also be anxious over the expression of overt aggressive responses in other interpersonal contexts.

There is a limit to the amount of structure that should be imposed on a fantasy stimulus in order to measure an *S*'s tendency to avoid aggressive interpretations. The nonpsychotic

child strives to be accurate in his interpretation of external stimuli. A completely unambiguous stimulus, e.g., two boys actively fighting, would therefore not produce sufficient variability among the themes told by a group of nonpsychotic *S*s. The pictures used in this study did not depict scenes of fighting and the child could tell nonaggressive stories without seriously distorting the stimulus.

These findings have some limited bearing on the problem of diagnosis and prediction in personality testing. Often the clinician is asked to predict the occurrence of behaviors that may elicit anxiety, e.g., aggressive, sexual, and overdependent behavior. It is suggested that story-telling techniques that include stimuli suggestive of these behaviors can provide the clinician with a measure of the amount of anxiety associated with these responses. Presumably, clinicians who use the Murray series of TAT cards interpret the lack of a sexual theme on picture 13MF or of an aggressive theme on 18 GF as tentative signs of anxiety in relation to these behavior categories.

SUMMARY

A direct and positive relationship between overt and fantasy aggression was predicted when (*a*) the fantasy stimulus suggests aggressive content and (*b*) the overt and fantasy behaviors are similar in mode of expression and goal object.

A set of specially devised pictures was individually administered to 118 boys aged 6–1 to 10–2 and the stories scored for five different categories of aggressive content. On the basis of teacher ratings of fighting behavior with age mates the sample was divided into five groups differing in degree of overt aggressivity.

The children who were rated as most likely to initiate fighting behavior produced significantly more fighting themes than those boys rated as extremely nonaggressive. Other categories of aggressive fantasy were not significantly related to the behavior ratings. In addition, more aggressive *S*s than nonaggressive ones produced stories of fighting to the picture most suggestive of a fighting theme. Occurrence of fighting themes to the picture least suggestive of such content did not result in differences between the aggressive and nonaggressive boys. It was hypothesized that failure to give aggressive themes to pictures that suggest aggressive content may indicate anxiety over aggressive thoughts and behavior. This anxiety is likely to lead to the inhibition of aggressive fantasy and of overt aggressive activity.

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CONTENT-FREE SPEECH AS A SOURCE OF INFORMATION ABOUT THE SPEAKER[1, 2]

JOHN A. STARKWEATHER[3]
Northwestern University

A DISTINCTION often made with regard to speech behavior is that between the verbal and the vocal aspects of speech. The verbal component is the pattern of sound which results in words, phrases, and other linguistic units making up the content of speech. The vocal components are all the remaining characteristics of sound which may be called tonal variation or voice quality. Soskin (12) has presented these two aspects in communication terms as the simultaneous operation of two communication channels, the verbal channel carrying potential semantic information and the vocal channel carrying potential affective information. He has also spoken of the vocal channel as the carrier upon which the content is superimposed.

When interest is primarily in the personality of the speaker, some consider the vocal component of speech more important than the verbal component. Both are, of course, present in normal undifferentiated speech, and one might expect a loss of some pertinent information with the removal of either component. A summary of studies since 1931 which have dealt with the reliability of judgments of personality from normal voice, with both kinds of information available at once (9), points out that a number of the studies found difficulty in this type of judgment.

It is possible that the inaccuracy of judging in these studies may be due in part to confusion arising between verbal and vocal aspects of speech. If one is primarily interested in the personality of the speaker, perhaps the isolated vocal aspect would be a better basis for judgment than normal speech. There are apparently only two studies which bear on this point (8, 13), both of which indicate the presence of affective information in speech rendered content-free by electronic removal of high frequencies.

One of these studies (8) also demonstrates the possibility of confusion between verbal and vocal components by showing less agreement among judges listening to the normal voice when its verbal and vocal components have been arranged to be incongruent.

Soskin (12) has presented the argument that a difference in meaning carried by the verbal and vocal components (incongruence) is produced when the speaker is in conflict, because the vocal channel is under less conscious control than the verbal channel. Verbal-vocal incongruence should then be characteristic of *S*s who are in conflict and have difficulty in control of their emotions. Normal, undisturbed speech, on the other hand, is presumed to be congruent, with appropriate similarity between meanings conveyed by verbal and vocal components. Following this suggestion, the general purpose in the present study is to compare judgments of the verbal and vocal aspects of speech with special reference to *S*s who may be expected to have some difficulty in controlling their emotions.

One group of *S*s who fit this description are those diagnosed as having essential hypertension. It has not been unusual for clinicians to propose that personality factors are associated with essential hypertension (1, 3, 10, 11). In particular these writers have stressed a constant struggle for control of hostile impulses

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[3] Now at Department of Psychiatry, University of California School of Medicine.

in patients with high blood pressure. Most of these writings have been based on qualitative observations during therapy. Evidence of a more convincing nature (7) indicates that similar variables are important with respect to *S*s (prehypertensive) who show transient high blood pressure early in life and have a high probability of later hypertension.

Harris (6) obtained a personality measure related to high blood pressure from descriptions of the 20 *S*s with highest blood pressure out of a group of 100. A 50-item Q sort was made by six observers of *S*'s behavior when in two role-playing situations. The Q-sort descriptions of 20 *S*s with highest blood pressure were combined to form a quantitative scale of observers' descriptions. Because of the association with high blood pressure, Harris has called the scale the hypertensive personality syndrome (HPS). He summarized the content of the items of *S*s with high blood pressure as involving dominance, assertiveness, initiative, and a lack of awareness or concern about other people. Though the HPS scale was derived from a relationship with blood pressure, this is far from a perfect correlation. He further compared two groups with equally high scores on the HPS scale but differing in blood pressure. Interviewers rated *S*s with high blood pressure as having more pathogenic childhoods and as significantly less at ease in interpersonal relations than *S*s with low blood pressure. The possibility was raised that whereas both groups were self-assertive, there was a harsher quality to the assertiveness of those with high blood pressure, perhaps bordering on hostility.

This difference suggests that it may be important to separate the variables of HPS and blood pressure. Voices of *S*s with high blood pressure should show evidence of aggressiveness and assertiveness when compared with *S*s having low blood pressure. In addition, assertive (high HPS) *S*s with high blood pressure should show a harsher, less acceptable quality in their voices when compared to assertive *S*s with low blood pressure.

The purpose of the present study is twofold. First, judgments of isolated verbal and vocal aspects of speech are compared with judgments of the same speech in its normal form. Second, the judgments are compared with respect to their relative usefulness for describing the personalities of *S*s who are likely to show verbal-vocal incongruence.

METHOD

Subjects

The *S*s were selected from 100 U. S. Air Force captains studied at the University of California Institute of Personality Assessment and Research. This group of officers has been described by Barron (2) and is the same group used by Harris (6) in derivation of the HPS scale. Three groups of ten were selected on the basis of their scores both on blood pressure recordings and on the HPS scale already described. The measure of blood pressure was an average of systolic readings under three conditions: resting, after mild exercise, and after recovery from exercise. For *S*s chosen for high blood pressure this measure exceeds 150, and for *S*s chosen for low blood pressure, less than 140.

The Harris (6) finding of differences between such a group and assertive *S*s with high blood pressure led to a comparison of three groups of ten *S*s each in the present study. These were: (I) a group with high blood pressure and high HPS, (II) a group with low blood pressure and equally high HPS (matched pairs on HPS), and (III) a group with low blood pressure and low HPS (matched pairs with group II on blood pressure). Mean HPS scores for the three groups were: I, 46.4; II, 46.6, III, 14.8. Mean blood-pressure scores were: I, 169.2; II, 130.6; III, 130.5. The HPS scores are the basis of difference between two groups (II and III) with equally low blood pressure. The blood-pressure scores are the basis of difference between two groups (I and II) with equally high HPS scores.

Speech Samples

Original recordings of role-playing sessions. The *S*s were seen in groups of ten for three days of living-in assessment. As one assessment procedure, they were studied one at a time in two interpersonal role-playing situations. A situation, a plot outline, and a role, were described to each *S*, as well as the role of the standard role-player, a staff member who played opposite him. The standard role-player guided the interaction in accordance with a prearranged outline and forced the initiative on the *S* at prearranged points. Observers of these situations were unanimous in asserting that the *S*s were obviously under stress, showing evidence of autonomic and skeletal tension, and indications that they were experiencing real emotion.

In the first situation *S* was asked to play the role of a spokesman for his fellow salesmen to protest the firing of a salesmanager whom they all respected. In this situation the standard role-player acted the part of the vice-president. He evaded any explanations of the firing of the salesmanager, but offered the same position to *S*, making it as attractive as possible.

In the second situation, *S* was assigned the role of a young man who has recently inherited his father's business. He was told that he had had adequate training and experience for the position, but that he had been away in the service; that he now finds many practices of the company to be out of date, but his plans are

blocked by the general manager. He has been debating whether or not to fire the general manager and has called him in to see him. In this situation the standard role-player played the general manager.

Selection of voice samples. For each *S* whose voice was to be used, three 20-second voice samples were chosen from the recordings of these two situations. In the first situation, the vice-president began by saying "I understand you wanted to see me." The *S* was then expected to explain his role as a spokesman for the other salesmen. One 20-second sample (Context A) was taken from this point. A second 20-second sample (Context B) was taken immediately after the vice-president offered the salesmanager's position. In the second situation the general manager who has been called in said "I understand you wish to see me," and a 20-second sample (Context C) was taken from the initial remarks of *S*. Although these three equivalent points in time were used to obtain comparable voice samples, there was of course no guarantee that they were equivalent in their implications to the *S*s.

The 20-second samples varied from 22 to 77 words, with a mean of 40. An attempt to relate the number of words used to any of the variables in this study was unsuccessful.

Derived recordings. The selected voice samples (a total of 90) were copied on recording tape in a random order with a ten-second silence between them. Four similar voice samples from other *S*s not in the experimental groups were placed at the beginning to be used as introductory samples in judging. When numbers were later inserted between voice samples, this tape became the normal material to be played back for judging. Another copy was made through an electronic filter in order to produce content-free material. The content of speech without vocal cues was reproduced in typescript. Thus, the stimulus materials were in three forms, each consisting of four introductory 20-second voice samples and 90 20-second experimental voice samples. The three forms of material differed in the *information* available to the judges: a filtered *content-free* recording, presented aurally with a ten-second space between voice samples; a *normal* recording, presented as above; and *content-only*, presented in typewritten form.

Judging

The judges were 75 students from an elementary psychology course at Northwestern University, divided into three groups of 25. One group judged the filtered, content-free speech samples; a second group judged the normal voice samples; and the third group judged the content-only samples from the typescript. Immediately following presentation of each voice sample, the judges wrote a scale value from one to six to indicate their judgment on each of two scales. One scale was labeled "submissive" at position one and "aggressive" at position six. The other was labeled "unpleasant" at position one and "pleasant" at position six.

Judges served on three successive days, judging 30 voice samples on the two scales during each session. They judged the four practice voice samples at the beginning of the first day and these were checked for an understanding of the instructions before proceeding to experimental voice samples. Presentation order was varied by groups of 30 voice samples. Samples 1–30 were judged first by some judges, samples 31–60 were judged first by others, etc.

The judges usually worked in small groups of eight or less, with seating spaced to maintain independent judgments, but occasionally a judge would work alone. Instructions for judgments of content-free and normal information were presented by tape recordings prior to the recorded practice voice samples. Instructions for judgments of content-only information were presented in typewritten form.

Apparatus

The original recordings were discs made on Gray Audograph equipment. They were copied with a Magnacordette PT6A tape recorder at 3¾ inches per second. The filtered version was copied with two Magnacordette PT6A recorders at 3¾ inches per second. Tapes were played back for judging using a TDC Stereotone model 130 tape recorder, an eight-inch Jensen speaker placed at a distance from the recorder and facing the judges, and a tape speed of 3¾ inches per second.

Electronic filter.[4] The isolation of vocal speech components for the presentation of content-free speech samples was accomplished by an electronic filter passing the frequencies from 100 to 450 cycles per second with a 60-decibel per octave attenuation at the upper limit.

Voices filtered in this way are reduced to a kind of mumble as though heard through a wall. One still hears indications of pitch, rate, and loudness, though probably a good deal of what is usually called voice quality is lost along with the high frequencies.

RESULTS

Analysis with Regard to Information Available for Judging

It will be recalled that data were gathered simultaneously on both "aggressive" and "pleasant" scales (the judges marked both scales in the intervals between voice samples).

Reliability estimates of judgments on the two scales are presented in Table 1. These estimates are based on the total 90 experimental voice samples, with independent

[4] This filter was made available by Dr. W. F. Soskin, and is described in detail in an unpublished paper by Soskin and Goodwin. Removal of frequencies above 450 cycles per second has most effect on consonants which are important for intelligibility. It has less effect on vowel sounds and total voice power. Further unpublished work by Soskin and Kauffman indicated that one to three per cent of speech content was correctly perceived with such a filter. Most of the correctly perceived words were articles and connective words which did not contribute measureably to the semantic meaning of the speech samples. While Soskin and Kauffman used a filter set at an upper limit of 550 cycles per second, a slightly lower cutoff frequency was used in the present study because of the low voices of some of the *S*s.

TABLE 1

RELIABILITY ESTIMATES OF "AGGRESSIVE" AND "PLEASANT" JUDGMENTS

Information	r_i	r_n
"Aggressive" Judgments		
Content-free	.42	.95
Content-only	.21	.87
Normal	.42	.95
"Pleasant" Judgments		
Content-free	.12	.77
Content-only	.14	.80
Normal	.26	.90

Note.—All the above correlations are significant beyond the .01 level. r_i is the intraclass correlation estimate of interjudge reliability. r_n is an estimate of the reliability of the pooled measure obtained from 25 judges (based on r_i).

groups of 25 judges for each type of information. Although all of these correlations are significant, it is obvious that the coefficients for interjudge reliability (r_i) are not particularly high. However, the pooled reliability for a group of judges (r_n) is quite satisfactory. These estimates are somewhat lower for "pleasant" than for "aggressive" judgments.

Since each judge rated all 90 voice samples, the 90 scores from one judge are not independent. The data were therefore analyzed by an analysis of variance of repeated measures described by Edwards (4). Thus, there are three types of information, each judged by separate groups, each of whom yielded 90 scores. Since the 90 voice samples represent only 30 different voices each appearing in three different contexts, the analysis also included a breakdown for the voice variable and its interactions.

"Aggressive" judgments. The analysis of "aggressive" judgments is summarized in Table 2. The test of significance for the information term is based upon independent, randomly assigned judges, and the error term is the variation between judges who used the same kind of information. The tests of significance for all other terms include a possible correlation due to repeated judgments by the same judge, and the error term is the interaction of judges and voice samples pooled for the three groups of judges. The pooling of the three interactions of judges times voice samples is based on the assumption that the mean squares associated with the three interactions are homogeneous. A chi-square test of homogeneity gave a value of 87.06 ($p < .01$, 2 *df*). (The interaction of judges and voice samples showed greater variability for judgments of content-only information.) However, if the most conservative estimate, the largest of the three mean squares, is used as error, all terms tested against it are still significant at well beyond the .01 level.

There is thus a significant difference between the three kinds of information. There is a significant difference between the voices of the 30 *S*s, as well as between the three voice samples of each *S*. This latter difference can be interpreted as the variation among the three contexts, pooled for the 30 *S*s. There are significant interactions both between information and voices, and between information and the pooled context variation.

Product-moment correlations were computed between the judgments of the three groups of judges, to determine the relationship between the three types of information available to them. The correlation between normal and content-free judgments was .79, between normal and content-only .22, and between content-only and content-free .17. An r of .205 is required ($df = 89$) at the .05 level for a significant difference from zero. Thus, the correlation between judgments of normal information and judgments of either

TABLE 2

ANALYSIS OF VARIANCE OF "AGGRESSIVE" JUDGMENTS

Source	*df*	Mean square	*F*
Information: CF, CO, N	2	155.320	11.16**
Between judges using same information	72	13.917	
Between voices	29	68.246	60.07**
Between voice samples of the same voice (pooled context variation)	60	16.678	14.68**
Information × voices	58	15.510	13.65**
Information × voice samples of the same voice	120	8.074	7.10**
Pooled judges × voice samples	6408	1.136†	

** Significant beyond the .01 level of confidence.

† See text for correction of this term for heterogeneity of variance.

TABLE 3
ANALYSIS OF VARIANCE OF "PLEASANT" JUDGMENTS

Source	*df*	Mean square	*F*
Information: CF, CO, N	2	74.985	11.16*
Between judges using same information	72	19.162	
Between voices	29	26.367	20.00**
Between voice samples of the same voice (pooled context variation)	60	7.990	6.06**
Information × voices	58	10.265	7.78**
Information × voice samples of the same voice	120	5.432	4.12**
Pooled judges × voice samples	6408	1.318†	

* Significant beyond the .05 level of confidence.
** Significant beyond the .01 level of confidence.
† See text for correction of this term for heterogeneity of variance.

isolated aspect of speech was significant, with a higher correlation appearing between judgments of the two kinds of information presented audibly. The correlation between the two isolated aspects of speech was not significant. Correlation plots were inspected and appeared to be normal and linear.

"Pleasant" judgments. The results of analysis of "pleasant" judgments, analyzed in the same way as the "aggressive" judgments, are presented in Table 3. It may be seen that there is a significant difference between the three kinds of information. There are significant differences both between the voices of the 30 *S*s, and between the three voice samples of each *S* (the pooled variation among contexts). Both the interaction between information and voices, and that between information and the pooled context variation, are significant.

Again, the three interactions of judges times voice samples, which were pooled to yield the error term shown in Table 3, were not homogeneous. However, use of the most conservative estimate of the error term (the largest mean square) does not change the levels of significance shown in Table 3.

The correlation between normal and content-free "pleasant" judgments was .51, between normal and content-only it was .20, and between content-only and content-free .02. Again an r of .205 is required at the .05 level for a significant difference from zero. Thus the pattern of correlations is much the same as for the "aggressive" judgments.

Relation between "aggressive" and "pleasant" judgments. Product-moment correlations were computed between judgments on the "aggressive" scale and on the "pleasant" scale. The correlation for content-free judgments was .62, for content-only judgments it was −.04, and for normal it was .82. It is clear that "aggressive" and "pleasant" judgments are related in the audible material, but that this is not true for judgments of the typescript.

Analysis with Regard to Voice Sample Variables

"Aggressive" judgments. Table 4 presents means of "aggressive" judgments for the three groups chosen on blood pressure (BP) and the hypertensive personality syndrome (HPS). The means are presented separately for the three types of information and for the three contexts.

Since each *S* spoke in three contexts, the three mean judgments for each *S* are not independent. The method of analysis of variance of repeated measures was again used for each of the three types of information separately. Thus, in the analysis for each type of informa-

TABLE 4
MEANS OF "AGGRESSIVE" JUDGMENTS BY GROUPS AND CONTEXTS

Groups	Contexts		
	A	B	C
Content-free Information			
I	3.28	3.54	3.57
II	4.01	3.84	3.94
III	2.78	3.02	3.22
Content-only Information			
I	3.95	4.26	4.08
II	3.96	4.23	3.78
III	4.03	3.61	3.94
Normal Information			
I	3.68	3.75	3.64
II	4.16	3.88	3.96
III	2.93	3.42	3.34

Note.—Group I has high HPS and high BP; Group II has high HPS and low BP; Group III has low HPS and low BP.

tion there are independent groups of *S*s who differ on HPS and BP scores, and each *S* yielded three mean judgment scores. Table 5 presents one of these analyses, that computed for content-free information. This table shows the only significant difference found in any of the three analyses: the three groups differ on "aggressive" judgments of content-free information.

The groups may also be compared in another way, appropriate because they differ on two variables, BP and HPS. Two groups, I and II, differ in BP and pairs of *S*s in these groups are matched on HPS. Groups II and III differ on HPS and pairs of *S*s in these groups are matched on BP. The third possible comparison, between Groups I and III, is not meaningful since these groups differ on both variables.

Comparisons were carried out in this way, i.e., between Groups I and II, and II and III, for the three types of information and for each context separately, resulting in 18 comparisons of "aggressive" judgments of the type shown in Table 6. The results may be summarized as follows, without presenting detailed tables of the other comparisons. There were no significant differences between groups in the *B* or *C* contexts (the second and third role-playing situations). Results for the *A* context amplify the previous over-all difference found for content-free information. In this context, the first psychodrama situation, judgments of content-free information differentiated both variables of BP and HPS (both Groups I and II, and II and III, were significantly different). Judgments of normal information differentiated the HPS variable but not BP (Groups II and III were significantly different, but I and II were not).

TABLE 5

ANALYSIS OF VARIANCE OF MEAN "AGGRESSIVE" JUDGMENTS OF CONTENT-FREE INFORMATION

Source	*df*	Mean Square	*F*
Between groups: I, II, III	2	4036.845	4.849*
Between subjects in the same group	27	832.454	
Between contexts	2	232.410	—
Contexts × groups	4	138.078	—
Pooled subjects × contexts	54	288.621	

* Significant beyond the .05 level of confidence.

TABLE 6

ANALYSIS OF VARIANCE BETWEEN HIGH AND LOW BLOOD PRESSURE GROUPS FOR "AGGRESSIVE" JUDGMENTS OF CONTENT-FREE INFORMATION IN CONTEXT A
(Groups Matched by Pairs on HPS Scores)

Source	*df*	Mean Square	*F*
Between groups: high blood pressure versus low blood pressure	1	1656.20	11.75**
Pairs matched on HPS scores	9	609.08	4.29
Groups × pairs	9	141.08	

** Significant beyond the .01 level of confidence.

The possibility that prehypertensive *S*s showed verbal-vocal incongruence remains to be investigated. Kauffman (8) obtained congruence ratings by having judges make direct comparisons between the same verbal content read with appropriate and inappropriate affect. In the present study, however, only one type of information was available to each judge, so the measure of congruence is necessarily the correlation between judgments of content-free and content-only information, the isolated vocal and verbal aspects of the speech samples. The product-moment correlation computed between the content-free and the content-only "aggressive" judgments was −.08 for Group I (high HPS, high BP), .44 for Group II (high HPS, low BP), and .01 for Group III (low HPS, low BP). An r of .355 is required ($df = 29$) at the .05 level for a significant difference from zero. Significant congruence, by the above definition, is found only in the voices of Group II (high HPS, low BP). Both Groups I and III are lacking in congruence.

The prediction follows from the findings of Kauffman (8) that a lack of agreement (ambiguity) among judges listening to the normal voice should be related to verbal-vocal incongruence. Group II shows significant congruence, and judgments of the normal voice should be more reliable for this group. Reliability estimates (r_i, intraclass) of judgments of normal information were as follows: .40 for Group I, .37 for Group II, and .41 for Group III. These are all significant beyond the .01 level, but since there is little difference between groups, there is no evidence of less ambiguity for Group II.

"Pleasant" judgments. All analyses that have been described for the "aggressive" judgments were also carried out for the "pleasant" judgments. They may be easily summarized: no differences were found to be significant. The correlations measuring congruence between "pleasant" judgments of content-free and content-only information were found to be as follows: −.18 for Group I, .21 for Group II, and .07 for Group III. These correlations are in the same relative order as those based on the "aggressive" judgments, but none here are significant, since again an r of .355 is required ($df = 29$) at the .05 level for a significant difference from zero.

Agreement among judges was again used as an inverse measure of ambiguity for the "pleasant" judgments. The correlations were as follows: .27 for Group I, .22 for Group II, and .27 for Group III. These are again all significant beyond the .01 level, but with little difference between groups. Contrary to expectation, judgments of Group II were slightly less reliable.

DISCUSSION

The Information Available for Judging

Results have been presented indicating acceptable reliability of judging for all types of information: content-free, content-only, and normal. The reliabilities were somewhat higher for the "aggressive" judgments than for the "pleasant" judgments. It was expected that confusion might arise between vocal and verbal information and affect the reliability of normal judgments. Significant differences in reliability were not present to bear out this expectation. The possibility remains that judging stereotypes may have more effect on normal information than on isolated aspects, leaving the latter more useful as personality measures.

Since there is an overlap of information between the normal voice and either isolated aspect of voice, a higher correlation was to be expected between normal information and either isolated aspect than between the two isolated aspects themselves. The results from both scales bear out this expectation. In addition, judges seem to have paid more attention to the vocal than to the verbal component when listening to the normal voice; that is, there was a higher correlation between the normal and the vocal than between the normal and the verbal judgments. The finding is in keeping with the expectation that vocal aspects of speech are more important for making expressive judgments, and that judges of personality characteristics will therefore tend to pay more attention to the vocal aspects when listening to a normal recording. To offset this finding, however, it should be pointed out that content was severely restricted in range in the speech samples used since subject matter was controlled by the role-playing situations.

The data give little evidence to justify the use of both "aggressive" and "pleasant" scales. For both kinds of audible information, judgments on the two scales were highly related, with a higher correlation for normal than for content-free speech. A similar finding for normal speech was reported by Eisenberg and Zalowitz (5), who investigated judgments of "dominance feeling" from normal recordings. They found judgments of dominance generally correlated with favorable qualities, concluding that this was evidence of judging stereotypes and that judgments of voice could not be relied on for personality description.

The high relationship between "aggressive" and "pleasant" judgments suggests that the judges interpreted the "aggressive" scale as "dominant" or "assertive," rather than as "hostile." Labeling the other extreme of this scale as "submissive" was perhaps unfortunate in suggesting this interpretation. If some *S*s were heard as "assertive," however, in a negative, hostile way, a difference would be expected between them and others in judgments of "pleasantness." The Harris finding (6) previously mentioned suggested a less acceptable quality in the assertiveness of high HPS *S*s with high blood pressure when compared to high HPS *S*s with low blood pressure. But the expected difference in "pleasantness" between Groups I and II in this study was not found.

Application of the Combined Judgments to Selected S Groups

It will be recalled that one purpose of the present study was to investigate the possibility that inaccuracy in judgments of normal

speech might be due to confusion between verbal and vocal aspects. This confusion is expected to be especially severe if verbal and vocal aspects are incongruent. A reason for choosing prehypertensive *S*s for this study was the possibility that they might show verbal-vocal incongruence, which would be shown by a lack of correlation between the isolated verbal and vocal aspects of speech. There was in fact no correlation found between the two aspects of speech of the prehypertensive *S*s (Group I). In contrast, the normal expectation of significant congruence was found for the assertive (high HPS) *S*s with low blood pressure (Group II). An unexpected finding was a lack of congruence for the unassertive (low HPS) *S*s with low blood pressure (Group III).

The measure of congruence does not seem related to the measure of ambiguity as defined by a lack of agreement in judgments of normal speech. This may seem to contradict the results of Kauffman (8) who found a relation between congruence and ambiguity, but it should be remembered that the judging scales and methods of measuring both congruence and ambiguity differ from his, and in addition, his voice samples were contrived to differ greatly in congruence.

"Aggressive" judgments of content-free and normal information differentiated the three groups. Voices of Group II were judged most "aggressive," voices of Group I intermediate, and voices of Group III least "aggressive." Judgments of content-free information were slightly more efficient in this differentiation. This finding is in line with the expectation that the presence of content may be a distraction for judges making expressive judgments. It should be pointed out that there is an element of contamination in the relationship between "aggressive" judgments and HPS scores, since the same voice information available to judges in this study was also available to the original observers from whose Q sorts the HPS score was derived. It is surprising, however, that the aggressive-HPS relationship reappeared in an unequivocal way from 90 short speech samples, presented in a completely scrambled order to judges who knew nothing of the original situations.

An unexpected difference was that of "aggressive" judgments between the two groups with equally high HPS scores but differing in blood pressure. The voices of those with high blood pressure were judged less "aggressive" than those with low blood pressure. The lack of an expected difference between these same two groups on "pleasantness" has already been mentioned. One speculation about the difference found might be that both these groups of *S*s were trying to appear assertive, and that prehypertensive *S*s succeeded in convincing Q-sort observers of the original situations with many cues, but could not control the vocal aspect of speech rated by judges of their filtered voices. The *S*s with low blood pressure and low HPS were not judged as assertive from either many or few cues.

The finding of better group separation for judgments of content-free information adds evidence to the contention that the vocal aspect of speech is of particular importance when interest is focused on the personality of the speaker.

SUMMARY

The present study was designed for two purposes. The first was a comparison of judgments of isolated verbal and vocal aspects of speech to judgments of the same speech in its normal form where both aspects are present. The second was to compare the relative usefulness of the judgments for personality descriptions of *S*s likely to develop essential hypertension, who are sometimes said to have difficulty in controlling the expression of emotion and whose speech may therefore show verbal-vocal incongruence.

Three groups of ten *S*s each were selected on the basis of their scores both on blood-pressure recordings and on a personality score related to high blood pressure. For each of the *S*s, three speech recordings, each 20 seconds long, were selected from the *S*s' responses at particular points in role-playing sessions. These 90 speech samples were used as stimulus material for judging in three forms which differed in the information available to the judges: a filtered content-free recording, a normal recording, and content only, presented in typewritten form. For each type of information a separate group of 25 undergraduates judged all 90 voice samples on scales labeled "aggressive," and "pleasant."

It was found that reliability of judging was acceptable, with somewhat higher reliability for "aggressive" than for "pleasant" judgments. The judgments for all types of information significantly differentiated the voices of the 30 *S*s, as well as the three voice samples of each *S*. In addition there were significant interactions of voices and voice samples with information.

The group with high blood-pressure scores showed a lack of significant verbal-vocal congruence. However, a measure of ambiguity of judgments of the normal information did not significantly differentiate the groups, and no relationship was found between the measures of congruence and ambiguity.

When the combined judgment of 25 judges was used as a measure, significant differences were found between groups for "aggressive" judgments of both content-free and normal information of speech samples from the first role-playing situation. Judgments of content-free information were related to both the blood-pressure measure and the personality measure associated with high blood pressure. Judgments of normal information were related only to the personality measure.

The finding of greater relative usefulness of content-free speech is evidence for the importance of the vocal aspect of speech regarding the personality of the speaker.

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INDIVIDUAL ANXIETY THRESHOLDS AND THEIR EFFECT ON INTELLECTUAL PERFORMANCE[1]

DOUGLAS H. HEATH

Harvard University[2]

RECENTLY there has been an increasing interest in the effect of anxiety on the performance of intellectual tasks (5, 7). Mandler and Sarason have proposed that a task may evoke drives which motivate task-relevant responses and an anxiety state which motivates either task-relevant or task-irrelevant responses (10, 11).

The strength of the anxiety motivation seems to be a function of task conditions, such as ego-involving instructions (7), and certain organismic variables, such as level of manifest anxiety (6). One organismic variable which has been relatively neglected is the individual's pattern of differential thresholds of anxiety in response to different situations. The importance of this variable has often been ignored or obscured by using one experimental condition which is threatening to most people in our culture, *e.g.*, reporting failure scores (5). The evocation of an individual's unacceptable needs and feelings about specific situations is assumed to arouse anxiety. The differences in the amount of anxiety consistently manifested from situation to situation define an individual's pattern of thresholds of anxiety. It is this pattern of thresholds that the psychologist must assess when he predicts how much anxiety the individual may manifest in particular relationships.

Knowledge of the individual's defensive patterns is also important for behavior prediction since the type of defense differentially affects the manifestation of anxiety (11). High abstract reasoning (1) and high academic standing (8), for example, both involving conceptual ability, have been found to facilitate task-relevant responses under anxiety conditions. Generally, little experimental work has been done on the defensive functioning of such attributes.

It is hypothesized that the number of task-irrelevant responses or amount of response disorganization (*a*) is greater under anxiety- than nonanxiety-arousing conditions; (*b*) is a function of the individual's pattern of differential thresholds of anxiety; and (*c*) is inversely related to the adequacy of conceptual performance.

METHOD

Subjects

Schizophrenics were used because their psychotically intensified anxiety responses to situations could be more easily identified and their defenses as a group are more homogeneous than are those of a nonclinical group. Extensive personal history material was also available for most *S*s. Male veterans of ages 25 to 40, 8th to 12th grade education, 18 to 120 months' hospitalization, and not under therapy were initially selected. The members of this group were then tested individually by *E* to secure *S*s who were able to complete successfully practice tests representative of the experimental tasks and who were also of average verbal intelligence as estimated by the Wechsler-Bellevue, Form I, vocabulary test. The first 24 *S*s who met these criteria were used in the experiment.

Conceptual Ability Measure

Following his selection, each *S* was given the Goldstein-Scheerer Object Sorting test. A scoring system based on Rapaport's (16) and Goldstein's (3) analysis of the sorting performance was devised to give a measure of conceptual ability. The scoring method evaluated both the degree and adequacy of abstract conceptual performance. The criteria used were (*a*) adequate abstract grouping correctly verbalized, (*b*) intermediate abstract groupings correctly verbalized, (*c*) inadequate, concrete groupings verbalized, and (*d*) pathological sortings. The Sorting tests were coded by a person other than *E*. The *E* then scored the tests. To check the reliability of his judgments, *E* rescored each *S*'s protocols one month later without any knowledge of the original score results, or of the *S*s' results in other tests. There was 88 per cent agreement between the two sets of scores. No major change in the relative position of

[1] This article is adapted from a Ph.D. dissertation, *The Effects of Severe Emotional Conflict on Intellectual Performance*, submitted to the Social Relations Department, Harvard University, in 1954. A review of the theoretical and experimental literature may be found in the thesis. The author wishes to express his appreciation to Dr. George Mandler, who supervised the study and generously assisted in the preparation of this article, Drs. Robert White and Gardner Lindzey of Harvard, and Drs. Norman Bowes, Samuel Grob, and Edward Davis of Bedford VA Hospital.

[2] The author is now at Haverford College, Haverford, Pennsylvania.

any *S* to the others of the group occurred.[3] The measure of conceptual ability was independent of verbal intelligence; rho was .03. In the analysis of the results, the *S*s were divided equally into a high conceptual and a low conceptual group on the basis of the Sorting scores. The two groups did not differ significantly on any of the selection criteria.

Anxiety Themes

Major anxiety areas frequently found for clinical groups such as schizophrenics were selected, *i.e.*, expression of dependent, sexual, and aggressive needs in different interpersonal situations. Each anxiety area was represented by two different threat themes. Three less anxiety-arousing areas (designated nonthreat) were also selected to serve as control themes in the experimental tasks. The threat and their corresponding control themes were as follows:

Threat Theme	*Nonthreat Theme*
1. Rejection by mother	7. Receiving, acceptance
2. Rejection by father	
3. Heterosexual relations	8. Work activities
4. Homosexual relations	
5. Mother-son aggression	9. Construction activities
6. Father-son aggression	

Upon completion of the Sorting test, each *S* was given a Phrase Association Test (designated PT) which defined the amount of anxiety he had about each of the nine themes. These themes could then be ordered for each individual from most to least threatening to give the *S*'s pattern of thresholds of anxiety responses in these different situations. Four phrases illustrative of each of the six threat and eight phrases illustrative of each of the three nonthreat themes were devised. The 24 threat and 24 nonthreat phrases were intermingled in the instrument and were preceded by five practice phrases.

The *E* read each phrase out loud, and the *S* reported the first phrase that occurred to him. Reaction time, exact response, and behavior changes were noted.

Disorganization in association to a specific phrase was assumed to indicate anxiety about the relevant theme. A scoring system of 14 different signs of association disorganization, based on criteria used in evaluating word-association tests (17), was used. These criteria were grouped into the categories of affective behavioral reactions, personalization of response, and disturbances in style, in meaning, and in phrase structure. The PT of each *S* was coded by a person other than the judges.[4] Then *E* and two skilled clinical psychologists who were familiar only with the general purpose of the experiment scored the responses. All of the judges had had experience using the criteria in their diagnostic work, and the two clinical psychologists were given additional instruction in the scoring procedure by *E*. Each judge worked independently of the other and without any knowledge about the *S*s. Each phrase was scored for the number of disorganization signs present. Then the themes were ranked according to the number of disorganizing signs tallied for the phrases of each theme. (Since the three nonthreat themes were each composed of eight phrases and the six threat themes were composed of four phrases, each nonthreat theme total was halved to make it comparable to the totals for the threat themes.) The theme with the greatest number of tallies was judged to be the most anxiety arousing.

The rankings of each pair of judges for each *S* were correlated. The means of the three sets of 24 rank-order correlations, based on z' transformation of the coefficients, were .78 ($p < .05$), and .84 and .89 ($p < .01$). These coefficients indicate high agreement among the judges in their scoring of the PT. It was possible to rank the judges with respect to the reliability of their judgments by use of Mosteller's reliability-analysis technique (14).

The two judges other than *E* were given anonymous summaries of all available case-history and hospital test material for each *S*. Each judge then ranked each theme area for amount of anxiety for each *S* on the basis of this material alone. They worked independently of any other knowledge of the *S* and of each other. Agreement between the judges was good as indicated by a rho of .72 ($p < .05$). The mean correlation, based on a z' transformation, between PT ratings and case-history ratings was .55 ($p > .05$) for one, and .72 ($p < .05$) for the other and more reliable judge (14).

Experimental Design

Two to four days following the administration of the Sorting Test and the PT, each *S* was given on each of two successive days a set of arithmetic word problems and a dissected sentences test. Each task was composed of a threat and a nonthreat series of questions. The content of each question was an elaboration of one of the phrases used in the PT. The threat and nonthreat series of one test were given on different days. A counterbalanced design was used to control for the order of the two series and for practice effects.

Dissected Sentences

A dissected sentence has its component words scrambled, and the task is to rearrange the words to make a meaningful sentence. To solve the task, one must "grasp the essential of a given whole; . . . break up a given whole into parts, . . . isolate and . . . synthesize them" (3, p. 4). Twenty-four threat and 24 control nonthreat sentences were composed, based on the PT phrases. For example,

[3] Additional evidence for the reliability of the measure was obtained when it was found that nine *S*s used in the experiment had been used in a previous research study and that eight of these nine had been similarly classified as low or high in conceptual ability. The classification had been based on only the correct abstract conceptual groupings and gave no credit for more functional or concrete groupings, as was done in the present study. The ninth *S* was close to the median of the group.

[4] A detailed description of the different judging procedures used throughout the experiment is available upon request.

Threat	*Nonthreat*
PT phrase	
Mother sent neglected child away	Principal gives milk to children
Dissected Sentence	
mother gave all The up her neglected for adoption children	principal brought red The out balloons for her children all
(The mother gave up all her neglected children for adoption)	(The principal brought out red balloons for all her children)

The threat and its control nonthreat sentence were each composed of ten words, matched for grammatical structure, number of alternative meaningful combinations, word frequency (based on the Lorge magazine count [18]), order of appearance in list, and order of words within the scrambled sentence.

The separate words were linotyped in 5/8-inch letters on cardboard. Following the instructions to rearrange the words to make the most meaningful sentence possible, *E* placed the words of a sentence in front of *S*. Three trial sentences were given before each series. The time to complete the sentence and the solutions were recorded. A time limit of 5 minutes per sentence was used.

The scoring system gave a combined score for the speed of sentence rearrangement and for the "meaningfulness" of the rearranged sentence. "Meaningfulness" was rated on a four-point scale from perfect meaning and grammatical structure to a meaningless sentence with no sensible relationships between component phrases of the sentence. The sentences of each *S* were coded. The *E* and a new judge who had not served as one of the PT judges then scored the sentences independently of any knowledge of who gave the individual sentences, the results of the PT (which had been scored but not tabulated at this time), or how well the *S* did on the matching series of sentences. The judges worked independently of each other and agreed in 94.9 per cent of the threat and 95.1 per cent of the nonthreat scores. The few disputed scores were then reanalyzed by both judges working together and an adjusted score agreed upon.

Arithmetic Test

Two series of arithmetic word problems, using the basic arithmetical operations of addition, subtraction, multiplication, and division, were constructed in the same manner as the sentences. Each threat problem had the same grammatical structure as well as the same arithmetical operation as its nonthreat counterpart. The number of words as well as the magnitude of the number computations for each threat and nonthreat pair were kept comparable. For example,

Threat

One year 48 baby birds were left by their mothers when flying south. 24 were left the next year. How many babies were left by their mothers in both years?

Nonthreat

One year 38 ships were painted while they were in the harbor. 14 were painted the next year. How many ships were painted while in the harbor in both years?

However, since the results with the arithmetic problems were generally negative, further details of test construction and scoring procedures will not be presented. Overlearned habitual operations such as addition and subtraction may be highly resistant to disruption by even severe anxiety.

RESULTS

Hypothesis *a* states that more response disorganization occurs under anxiety than nonanxiety conditions. Only the data for the sentences will be presented as the arithmetic results were negative with respect to the hypotheses. A split-plot analysis of variance was made. Table 1 indicates that the anxiety variable was highly significant ($F = 26.48$, $p < .001$). Thus, the hypothesis is confirmed with the sentence results. The significant interaction ($F = 11.25$, $p < .01$) indicates that the disorganizing effect of threat is increased or decreased, depending upon its interaction with the degree of conceptual ability and the order of the threat series presentation. For example, the low conceptual group receiving the threat series the first day gave the most task-irrelevant responses, and the high conceptual group receiving the nonthreat series the second day gave the fewest task-irrelevant responses of any group.

TABLE 1

ANALYSIS OF VARIANCE OF DISSECTED SENTENCE PERFORMANCE OF *S*s HIGH AND LOW IN CONCEPTUAL ABILITY

Source	*df*	Mean square	*F*	*p*
Whole Plot				
Conceptual ability	1	6864	2.19	
Replications	5	3815		
Error	5	3148		
Subplot				
Days of testing	1	1102	3.16	
Anxiety	1	9241	26.48	.001
Anxiety × Ability	1	768	2.2	
Anxiety × Days	1	16	.04	
Days × Ability	1	342	.98	
Anxiety × Days × Ability	1	3924	11.25	.01
Error	30	349		
Total	47			

TABLE 2

DIFFERENCES IN DISSECTED SENTENCE PERFORMANCE IN THE THREAT AREAS JUDGED TO BE MOST ANXIETY-AROUSING AND LEAST ANXIETY-AROUSING

Threat areas with most and least number of PT anxiety responses	Performance Mean (N = 24)		t	p*
	High-threat area	Low-threat area		
3 high-threat vs. 3 low-threat areas	62.6†	52.7	2.47	<.025
2 high-threat vs. 2 low-threat areas	40.9	34.0	2.11	<.025
Highest threat vs. least threat area	21.4	17.2	2.35	<.025

* One-tailed test of significance.

† High score indicates poorer dissected sentence performance.

Hypothesis *b* states that the amount of response disorganization in a specific situation is a function of the individual's threshold of anxiety response to that situation. To evaluate the relationship between performance on the sentences and the amount and type of anxiety, the sum of anxiety responses as judged by the most reliable judge was determined for each of the nine themes from the PT performance of all 24 *S*s. Thus, it was possible to rank each theme from most to least anxiety-arousing for the entire group of *S*s. The sum of the sentence scores for each of the nine themes was obtained and ranked similarly for the entire group of *S*s. The rank-order correlation between these two measures was .79 ($p < .01$), indicating a significant relationship between the amount of anxiety about specific situations and the amount of intellectual disorganization in the same situations.

To evaluate the relationship between the sentence performance and the amount and type of anxiety for each *S*, the sentence performance of each *S* in the nine theme areas was ranked from most to least disorganizing. The most reliable judge's judgments of the amount of anxiety manifested in each of the nine areas on the *S*'s PT were ranked similarly. A rank-order correlation was obtained between these two measures for each *S*. The average rank-order coefficient, based on a z' transformation, of the 24 correlations was .45, which is not significant. Since the analysis of variance suggested that more response disorganization occurred when the threat series preceded the nonthreat series, i.e., before task-relevant responses could be learned, mean rank-order correlations were obtained separately for those *S*s who received the threat series first (Group I) and for those *S*s who received the nonthreat series first (Group II). Group I obtained a mean coefficient of .66 ($p = .05$), while Group II's mean coefficient was only .18. The hypothesis therefore seems further supported.

A more specific test of the hypothesis involved the determination of whether significant differences obtained in performance scores between the different anxiety themes of the threat series *alone*. Each *S*'s test performance in that area judged from the PT to be most anxiety-arousing for him was compared, using t tests, with his performance in that threat area judged to be least anxiety-arousing for him. Table 2 shows that the difference in performance between the most and the least threatening areas was significant at the .025 level or better. This effect persists whether one compares the performance in the two most and two least or in the three most and three least threatening areas as well. The hypothesis seems substantially confirmed.

Hypothesis *c* states that the amount of response disorganization is inversely related to the adequacy of conceptual performance. Difference scores were obtained for each *S* by subtracting his nonthreat score from his threat score on the sentences. The product-moment correlation between this difference score and the Sorting test score was $-.40$ ($p < .05$) for the 24 *S*s. Thus, high conceptual ability is related to the maintenance of performance efficiency under threat conditions.

The hypothesis was also explored with extreme groups. Since the Sorting score system gives only a rough approximation of conceptual ability, it should more validly discriminate between the extremes. Accordingly, the six *S*s who obtained the highest and the six *S*s who obtained the lowest Sorting scores were selected. These two groups represented equal numbers of *S*s exposed to the different experimental conditions. There was no significant difference in intelligence between the two groups. The mean of the threat minus nonthreat differences of the low group was 40.8, and the mean for the high group was 17.7 ($t = 1.84$, $p < .05$). The hypothesis was thus essentially confirmed.

Because the low-conceptual *S*s may have been more anxious and therefore performed more poorly in general, the number of anxiety responses given by each *S* to the PT was used to get a rough approximation of the degree of anxiety manifested. Chi squares for all the high and low *S*s and for just the six extreme high and six extreme low *S*s were nonsignificant.

DISCUSSION

The results support the general proposition that severe anxiety interferes with intellectual performance. Of greater significance, however, is the experimental demonstration that an individual's pattern of thresholds of anxiety responses to different situations is a major variable in the production of task-irrelevant responses. The Mandler-Sarason thesis must be extended to include this variable as an important condition for the occurrence of task-irrelevant responses. The findings also have implications for personality assessment. One major criticism of personality descriptions has been their lack of specificity with respect to the precise situations which evoke anxiety in the individual. To increase the specificity of their descriptions, psychologists have analyzed the content of projective and intelligence test responses in which manifest disorganization occurs and have inferred that the *S* is most anxious about the topic indicated by that particular content. The present study gives some support to the theoretical assumption which underlies this method of analysis; more disorganization occurs in those areas that are more anxiety-arousing for the individual. However, the statistical results are not as significant as would be desirable to use the various procedures devised in the present experiment for diagnosing an individual's specific anxieties. Additional caution is necessary when generalizing these findings to account for response disorganization in view of other findings that not all disorganization is due to anxiety. Limited ability, unfamiliarity with the task (4), ambiguous instructions or stimulus content (15), and strong personal needs and convictions (9, 12, 13) also appear to hinder the production of task-relevant responses. Furthermore, since pathological emotional states such as schizophrenia accentuate the production of task-irrelevant responses (19), differential response disorganization in varying anxiety areas may not be as pronounced with nonschizophrenics whose defenses are more adequate to cope with anxiety-producing material.

The results also extend to schizophrenics the applicability of the generalization that severe anxiety adversely affects intellectual performance. Chronic schizophrenics show differential behavior under anxiety conditions and more response disorganization in specific anxiety-arousing situations. Some psychoanalysts interpret schizophrenia to be a severe withdrawal from reality in order to allay intolerable anxiety. The ego of the schizophrenic "returns to its original undifferentiated state; that is, it dissolves entirely or partly into the id, which has no knowledge of objects and reality" (2, p. 439). One implication of this hypothesis is that schizophrenic behavior is relatively impervious to disruption by different anxiety stimuli. To the extent that the behavior of the *S*s here was disrupted by anxiety stimuli, this contention needs to be re-evaluated.

Finally, the results indicate that high abstract conceptual ability may act as a defense against anxiety. To maintain a set, to note similarities and differences, and to translate these differentiations into abstract concepts apparently facilitates the suppression of strong affective responses to anxiety situations.

SUMMARY

The study explored several conditions which interfere with or facilitate the production of task-relevant responses in intellectual tasks under anxiety conditions. The relation of response disorganization to an individual's thresholds of anxiety in different situations and to conceptual ability were investigated. The results were as follows: (*a*) Schizophrenics show significantly more response disorganization on abstract intellectual tasks under anxiety than under nonanxiety conditions; (*b*) the amount of response disorganization is a function of the individual's pattern of differential thresholds of anxiety; (*c*) the amount of response disorganization is inversely related to the degree of abstract conceptual ability.

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CASE REPORTS

"OPPOSITE SPEECH" IN A SCHIZOPHRENIC PATIENT

JULIUS LAFFAL, L. DOUGLAS LENKOSKI, AND LANE AMEEN[1]

Veterans Administration Hospital, West Haven, Connecticut[2]

THE distorted speech of the schizophrenic has been described by White (12) and Woods (13) as the product of a regression characterized by reversion to a lower order of abstraction than normal adult language. Goldstein (6) also pointed out the relative concreteness of schizophrenic thought and language, and Woods (13) further described schizophrenic language as "elliptical." Freud regarded language distortions in schizophrenia as consequences of the same process as in the dream, the primary process, in which condensation and displacement function freely (4, p. 437). One of the effects of the schizophrenic's distorted speech is to make communication between him and others extremely difficult, and this difficulty appears to be what Sullivan had in mind when he wrote (11, p. 8): "Since language is the most subtle and powerful lever that any culture provides, most linguistic operations of human beings in general, and all linguistic operations of the schizophrenic, have to be oriented toward the pursuit of something quite impossible of attainment: a feeling of security in the presence of strangers. As the schizophrenic, because of the very insecurity which has always characterized him, has tended even more to divorcement from these fellow men with whom he has never felt secure, the language operations at the height of the schizophrenic episode show most perfectly the sheerly magical operations which men effect by language."

In this paper we report an unusual language syndrome in a schizophrenic patient. The syndrome, which we have called "opposite speech," consists basically in the use of "yes" by the patient when he means "no," and vice versa. We have not been able to delineate fully the extent to which this reversal has generalized in his language use, but we have been able to demonstrate that, besides the interchange of "yes" and "no," it includes the interchange of "right" and "wrong," the interchange of "do" and "don't," and occasionally the interchange of such opposites as "something" and "nothing" and "like" and "hate." The syndrome appears to be both receptive and expressive, and it includes written as well as oral speech. While the documentation to be presented shows the opposite speech primarily in its expressive aspects, the receptive distortion has been noted in the patient's misinterpretation of simple instructions and statements. The following is a brief description of the patient in whom the language reversal has occurred. Some insignificant details have been altered for the sake of anonymity.

Peter is a twenty-four year old single man who first exhibited psychotic behavior while serving as a gunner with a mortar company in combat in Korea. At the time of admission to the field hospital he was mute, and subsequently he neither ate nor talked for three days. Information accompanying him to the field hospital revealed that he had been hearing voices telling him he was dirty, that he spread disease, that he was an S.O.B. and a pervert. He was transferred to the United States one month later. At that time he ate very little because he felt that his food contained chopped up people and worms. He equated worms with penises. After a total of 45 electric shock treatments without sustained improvement, he was transferred to a Veterans Administration hospital. There he was better oriented and in fair contact, and during the next few months, he was given several passes and leaves of absence and was finally placed on trial visit approximately fourteen months after his initial breakdown on the battlefield. Three months after the beginning of his trial visit, he became quite agitated, telling his mother that one of the girls in the neighborhood was calling his name and would not leave him alone. He began to pound on the wall and shout that he wanted the name-calling to stop. It was at this point that the patient was brought to his present Veterans Administration hospital. There was no mention in the fairly detailed Army and previous Veterans Administration hospitalization records of the opposite speech.

The patient is an only child. His parents are frugal, lower middle class people, who apparently were always able to provide their son with things other boys had. They describe him as having been shy and introverted but always a good boy. He was an average student, being graduated from high school at the age of eighteen.

[1] The authors are indebted to Dr. Norman Cameron of Yale University for his invaluable suggestions in preparing this paper.

[2] From the Neuropsychiatric Service, U.S.V.A. Hospital, West Haven, and the Department of Psychiatry, Yale University School of Medicine.

Concerned about his slender physique, he sometimes worked enthusiastically with weights to build himself up. He was too bashful to go out with girls, and as far as can be ascertained, had no heterosexual relations. Following graduation from high school, he worked in an upholstery shop until drafted into the Army. The family matrix includes an exceedingly protective, indulgent, and yet controlling mother, and a relatively ineffectual father.

In asking the patient routine questions at admission, the resident was struck by the confusing answers that he received. The patient appeared to substitute "yes" for "no," and "always" for "never." The patient's parents first noted this type of reversal on the day prior to his admission when the patient said at lunchtime, "I'm hungry." His mother prepared a sandwich, and when she offered it to him he rejected it. In his behavior on the ward, the patient was withdrawn, uncommunicative, compliant, and well-behaved despite some agitated periods when he hallucinated a marriage and the presence of his "wife" in the hospital, and when he hallucinated the presence of his mother on the ward. The hallucinatory and delusional content was mainly sexual and religious in nature. Neurological studies were noncontributory.

Psychological tests reflected the clinically patent thought disorder. Eight responses were given to the Rorschach, all of which were whole animal responses, and half of which were minus responses. The Wechsler IQ was 71, with Verbal IQ 89 and Performance IQ 56. The breakdown in intellectual functioning was clearly due to the intrusion of psychotic material, and in light of the patient's scholastic record as a high school graduate, his intellectual potential must be considered higher than shown by the test. Word association and sentence completion tests demonstrated the opposite speech syndrome in some of the responses. Thus, to the stimulus *limp* he responded, "Limping around, able to walk." To *disgust* he responded, "Disgusted, when you're feeling good, happy and contented." To *stammer* he responded, "Stutter. When the words come out easier and you have trouble." On the Michigan Sentence Completion Test, orally administered, some of the completions were as follows: *What makes me angry is* "if things go right, the weather is good, if I'm feeling good, and mad at myself." *When people make fun of me* "I feel good, I get very nervous inside, I start to like." *Home* "there's any place like home. Home is the best cure." *I feel like cursing when* "things go good, or if I have any hard luck, get in trouble in any way. Well, if things go right. . . . If I have some plans and things come up to break it . . . don't come up to break it." *I dream* "of . . . sometimes of things that are . . . things that seem real, but they are real, but they don't seem real . . . could be true, yet not fictitious. You dream you're a doctor when you are a doctor, when you're just an ordinary person." *She disliked him when he* "was with her . . . against her . . . not against her . . . making her happy, comfortable." *I feel like smashing things when* "I'm calm."

In explaining proverbs, the patient's opposite speech was apparent, and it was evident as well that the reversals were not consistent but intermittent and hence even more confusing. Thus, when asked to explain the saying, *When the cat is away the mice will play*, the patient responded, "If the mice are in the presence of the cat they won't play. If the cat isn't present while the mice aren't there, of course the mice can't play." To *Don't cross your bridges until you come to them*, the patient responded, "Why worry about your bridges. In other words, when you're in front of something, worry about it. Before you meet it . . . (Patient pauses; examiner encourages him.) . . . If I got to meet somebody that's my enemy. . . . Well, suppose I didn't know it, and I don't meet him, what in heaven's name am I going to do about it? Just confront him, even if I didn't know I was going to meet him." To *Don't look a gift horse in the mouth*, the patient responded, "I know what the hell a gift horse is."

Shortly after the patient's admission, the burden of his treatment as well as of the exploration of the speech syndrome fell to JL with LDL retaining the role of co-therapist and assuming administrative and medical responsibility for the patient. The emphasis in all contacts with the patient has been upon treatment, and relatively little time with him has been devoted to exploration of the speech syndrome as such. These points are mentioned because the secondary reward aspect of the speech syndrome may be thought to be of importance in its persistence. Throughout the more than eight months of the current hospitalization, the opposite speech pattern has remained adamant, although it has not been consistently present or consistently used. The symptom also persisted under amytal, which, incidentally, had the effect of bringing out hallucinatory and delusional material about

which the patient was ordinarily taciturn. Below are presented portions of two recorded interviews, the first without medication and the second under amytal, which further demonstrate the opposite speech.

Interview Without Medication

Dr. When did you come in the hospital? . . . When did you come in the hospital? . . . When?
Pt. I came in the hospital about five weeks ago, and when I'm going to leave I know.
Dr. When? You say you know when you're going to leave?
Pt. I do.
Dr. Can you tell me when?
Pt. When I'm going to leave I do know. Of course it's not up to the V.A. when I'm leaving. It's not up to the doctor.
Dr. Who is it up to?
Pt. It's not up to my doctor.
Dr. Who? Who is it up to? You say it's not up to your doctor. Who is it up to? Why are you smiling? You said it's not up to the doctor. Did you get your words mixed up?
Pt. Yes.
Dr. What did you mean to say? You got your words mixed up. You said it's not up to the doctor when you leave.
Pt. It's not.

Interview Under Amytal

Dr. JL. Peter, I want to ask you something. I'm holding a pipe here in my hand. Do you see this pipe?
Pt. No.
Dr. JL. Dr. L, do you see this pipe?
Dr. LDL. Yes, I see the pipe.
Dr. JL. Peter, how is it when I show you the pipe, you say, no you don't see it, and Dr. L says, yes, he does see it. How is it he says yes and you say no?
Pt. Well . . . The doctor says he don't see it?
Dr. LDL. I do see it.
Pt. You do see it?
Dr. JL. What do you say, Peter?
Pt. I do see the pipe.
Dr. JL. You do see the pipe?
Pt. Unnnhhh.
Dr. JL. Now, wait, you tell me. I've got the pipe here in my hand. Do you see the pipe?
Pt. Nope, I don't see it.
Dr. JL. Dr. L, do you see this pipe?
Dr. LDL. Yes, I do.
Dr. JL. Peter, how is it that Dr. L says yes and you say no, and I ask you both the same question. How is that? Can you explain that?
Pt. Well. . . . What was that?
Dr. JL. How is it when I show you and Dr. L the pipe and I say do you see the pipe, you say, no, I don't see it, and Dr. L says yes I do see it? You're both looking at it and you both give different answers. How is that?
Pt. Probably in his eyes he sees it some way different.
Dr. LDL. What's in his hand, Peter?
Pt. A pipe.
Dr. LDL. What color is it?
Pt. It's brown.
Dr. LDL. Do you think it's brown?
Pt. No.

In an effort to map out the extent of the reversals, several series of questions were devised in which the patient was required to write his choice of a pair of opposites. In some of the series when the patient had responded with a written answer, he was queried orally on the same items and his answers were noted. Below are some of the items and the responses. The choice pairs are indicated above the items.

Yes-No	*Written answer*	*Oral answer*
I am a man.	No	Nope, I'm no man.
Snow is black.	Yes	Right.
Right-Wrong		
A midget is taller than a giant	Wrong	Should have put right.
One and one make two.	Wrong	Wrong
Like-Hate		
Cats____milk.	Like	Like.
My mother____me.	Likes	Hates.
Always-Never		
Sunday____comes before Monday.	Always	
We____get wet when we go swimming.	Never	

The opposite speech syndrome which has been described has occurred in the patient's conversations with nurses, aides, other patients, and his parents. The self-isolating effect of the syndrome has been seen most vividly in group activities in which other patients, after receiving opposite answers, have given up attempts to communicate with Peter. With respect to the influence of the therapist-researcher on the perpetuation of the syndrome, there is evidence, as in some of the examples presented, that the patient is not conscious of the reversal and that it is used in ordinary life contexts where the therapist is not present. We may suspect that some heightened awareness that he is speaking differently from others has been produced in the patient by the repeated queries of the doctors, but the denial of this difference by the patient emphasizes the basically automatic feature of the syndrome.

Discussion

Undoubtedly the yes-no discrimination is one of the best learned in language behavior,

and reversal of this discrimination is an event of momentous consequence for the individual.[3] The fact that a fairly circumscribed set of habitual discriminations is involved makes one feel that this reversal is the type of event that learning theories should help explain. Unfortunately, the learning theory analysis of language has not yet systematically integrated or even dealt with pathological language (2, 9, 10). Osgood (10) has given a careful discussion of the relation of motivational states to language production, but makes little mention of pathological language. Typical predictions from a learning theory approach to language may be exemplified by the following quotations from Osgood (10, p. 165): ". . . the effects of increased generalized drive upon habit-family hierarchies will be to further augment the probability of the dominant response and relatively damp the probabilities of weaker reaction tendencies. This has important implications for language behavior under stress conditions." Another way in which drive may operate is by cue effects of the drive: "If the motive state of anger has been associated with swearing responses, subsequent occurrences of this motive state will increase the probability of such responses."

If we regard the psychotic patient as a person under stress, the first type of prediction would appear to call for a strengthening of the appropriate *yes* and *no* responses. The second type of prediction, based on the cue effects of drives, appears to be capable of encompassing the type of speech syndrome seen in this patient, but only with considerable elaboration.

Mowrer in his discussion of language has noted (9, p. 689): "how quickly we approach the unknown in psycholinguistics as soon as we depart from a circumscribed problem or conceptual model." Our insecurity vis-a-vis pathological language may be in part due to the fact that the so-called pragmatic (8, p. 38) and interpersonal functions of language behavior (5) have been largely neglected by learning theorists in favor of the meaning or semantic aspects. The case described in the present paper, in which a fundamental language habit is distorted, demonstrates the importance of language as a functional behavior in dealing with the world and serving the needs of the patient. We must now attempt to understand what uses the opposite speech may serve in our patient.

The schizophrenic negativism which Kraepelin (7) and Bleuler (1) have described at length, appears to be related to the symptom of this schizophrenic patient. His speech syndrome, however, differs from typical schizophrenic negativism in two important respects. One, the patient is unaware of his reversals, and second, the reversals are confined to language and do not extend to the thought or action. Thus, if asked if he wishes a cigaret, the patient may say, "No," instead of "Yes, I do," but he accepts and smokes the cigaret. The patient's speech produces confusion and dismay in the listener as does the schizophrenic's negativism, but it does not have the same negativistic connotations for the patient since he is unaware of his reversals. His syndrome avoids the open hostility which is so frequently an obvious aspect of schizophrenic negativism, but it has a similar outcome of reducing communication with and effectively rejecting others.

The Freudian interpretation of negation (3, p. 182) as ". . . a way of taking account of what is repressed, indeed, it is actually a removal of the repression, though not, of course, an acceptance of what is repressed," may be applicable to this patient's speech syndrome, since the speech reversal permits the verbalization of ideas which the patient consciously rejects. Freud's view (3, p. 185) would also lead us to examine how the patient deals with hostility, since the withdrawal of libidinal cathexes of objects in schizophrenia presumably leaves the schizophrenic's aggressive impulses without restraint.

One of the features of this patient's personality, remarked by all who have had contact with him, is his extreme passivity. On only one occasion during his more than six months of current hospitalization did the patient become overtly aggressive. This was when his mother, who had been visiting regularly, appeared one day at a time when he was desperately requesting release from the hospital. Seeing her, he began to pound on the door with his fists and to accuse her of keeping him locked

[3] The changed relationship to the world of reality which is effected by this simple reversal may be demonstrated for himself by the reader by trying *sub voce* reversed interpretations of what others say and of what one wishes to say. It is not recommended that this test be made aloud!

up. He calmed down within the space of a few minutes and had a very quiet visit with his mother a short time later. He has been assaulted several times by other patients, but in each case he accepted the attack without attempting to fight back. Further clues pointing toward the importance of hostility in this patient's pathology and in his peculiar speech syndrome are the facts that his original breakdown occurred during combat and that his delusional and hallucinatory productions have been primarily sexual and religious, with relatively little forthright aggressive content. We do not wish to convey the impression that aggressive tendencies have completely disappeared in this patient, but we do stress the notable lack of such behavior in situations which seem to invite it.

The process by which unacceptable aggressive impulses—if the suggested relationship is correct—are dealt with by the speech mechanism is not clear. The reduction of communication with others is the most tangible thing to which one can point. We would predict, on the basis of our reasoning, that if this man's speech syndrome were to clear we would either see the outbreak of aggression or find aggressive content in his fantasies.

SUMMARY

An unusual speech syndrome of a schizophrenic patient, in which "yes" and "no" and other opposites are reversed without awareness on the part of the patient, has been described. In discussing the reversal of a strongly established linguistic discrimination, it was pointed out that learning theorists have largely neglected the study of pathological language. Psychiatric and psychoanalytic studies of schizophrenia and pathological language provide some rationale for understanding the language distortion described. Evidence was offered to support the view that the opposite speech of the patient served primarily as a means of coping with hostile impulses.

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THE APPLICATION OF CONDITIONING AND LEARNING TECHNIQUES TO THE TREATMENT OF A PSYCHIATRIC PATIENT[1]

H. GWYNNE JONES

Institute of Psychiatry (Maudsley Hospital) University of London

An experimental approach to the diagnostic investigation of psychiatric patients has been advocated for some time (3, 6, 7). Experimental techniques applying the findings of experimental psychology, particularly those pertaining to learning processes, are equally relevant to the *treatment* of psychiatric symptoms. This paper is presented in illustration of such application.

Summary of the Case History

The patient, a young woman of 23 years, was admitted to the hospital on a day-patient basis for investigation and treatment.[2] She complained of frequency of micturition with associated secondary fears and general lack of confidence. One instance of psychiatric disorder was reported in the family history, a sister being described as suffering from an "hysterical" paralysis. At the age of 14, the patient left school, where she had been an above average scholar and athlete. She was described as quiet and timid but no other abnormalities were reported. During the next four years she enjoyed a successful and progressive career as a "soubrette dancer" with various theatrical companies. She was described as a quiet and timid person off the stage but self-assured on it. Her feelings were easily hurt and she "took everything to heart." She complained that she disliked the lax moral tone of stage life.

The patient's sexual history was thought to be relevant to her illness. At 17 she met and became engaged to a young man of 23. They had sexual intercourse, practicing "coitus interruptus," which caused her some anxiety. She submitted but found it unpleasant. After a year, discovering her fiance's infidelity, she broke off the engagement but retained some affection for him. Before this, she discovered that he had suffered from gonorrhea but claimed to be cured. She later developed a vaginal discharge, but medical investigation failed to indicate venereal disease. Some two years later, she entered into a relationship with an older man. This gave her more pleasure, but it terminated with her discovery of the man's concurrent engagement to another woman.

The urinary frequency started when the patient was 17 at about the time she met her first fiance and, within a year, became a serious embarrassment. By the time she was 19 it made much stage work impossible, but she continued to work sporadically for a further two years. She then lived for a year with her mother, during which time the frequency remained unchanged with steadily increasing anxiety symptoms. She complained of a pain in her abdomen after urinating which persisted for from five to ten minutes. As an example of her anxious state, she described a shopping expedition after a morning indoors during which she felt well. As soon as she reached the door, she experienced what she described as a "panic" that she might pass urine. Her legs shook, the traffic sounded very loud, and she became out of breath. In fact she has never been incontinent out of doors, but, on one occasion, she became so immediately after entering the house. After a year with her mother, she made a final attempt to return to the stage but failed to start work. This shortly preceded her admission to hospital.

On examination when admitted to hospital the patient was described in the following terms.

Physically. Passes urine approximately every ½ hour with abdominal pains. Evidence of autonomic imbalance in that her limbs are at times very cold, at other times warm, and she sweats copiously. Slightly enlarged vascular thyroid.

Mentally. Friendly, quiet, and serious with no his-

[1] This article is based upon a paper presented to the British Psychological Society at Durham in April, 1955.

[2] This patient was under the care of Dr. A. Harris, consultant psychiatrist to the Bethlem Royal and Maudsley Hospitals. Without the permission, cooperation, and medical supervision of Dr. Harris and his registrar, Dr. P. M. Middleton, this experiment could not have been carried out. Their encouragement and assistance are gratefully acknowledged.

trionics. Easily embarrassed. Talks frankly and to the point. Not depressed but somewhat hopeless and low spirited. Sleep moderate. Appetite fair.

Extensive specialist gynaecological, urological, and neurological examinations failed to reveal any local or general physical abnormality, nor was there evidence of venereal disease. Psychiatric investigation indicated that the illness was of the nature of an anxiety reaction with hysterical urinary frequency. Psychotherapy and general day-hospital treatment over a period of five weeks produced very little change in her condition. At the end of this period it was suggested that she be discharged from the day-hospital, advised to give up her stage career to which she had shown ambivalent attitudes, and advised to take up such employment as secretarial work in which toilet facilities were always available. In this way it was hoped that the symptoms would improve gradually. The patient reacted very strongly and negatively to these suggestions and was unwilling to contemplate the relinquishment of her stage ambitions. At this stage the psychologist was consulted as to the possibilities of applying learning techniques to the symptomatic treatment of the urinary frequency.

SYMPTOMATIC TREATMENT OF THE URINARY FREQUENCY

The work of Mowrer (5) and others on the treatment of enuresis indicates that the bladder is an organ susceptible to training and conditioning procedures. More relevant to the present problem is experimental work described by Bykov (1). In these studies, warm water was introduced into the bladders of human *Ss*, the pressure changes being recorded graphically and displayed on a manometer placed before the *S*. This manometer could be disconnected without the *S*'s knowledge. Since the urge to urinate tends to occur at a definite pressure for each individual, the *Ss* rapidly developed a "connection"[2] between the manometer reading equivalent to this pressure and the urge to urinate. An intense urinary urge and an associated galvanic skin response could be elicited merely by calling out, via a microphone and loud-speaker, the figure of the critical manometer reading. This response occurred even when the bladder contained practically no fluid. Conversely, and of more direct interest, if the manometer, disconnected without *S*'s knowledge, registered zero, it was possible to introduce far greater quantities of fluid than normally produced urination without evoking the urgency response.

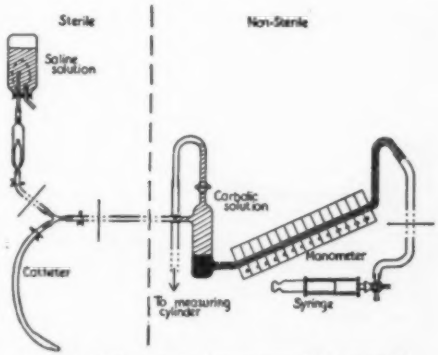

FIG. 1. CYSTOMETRIC APPARATUS (Not to scale)

In the light of this report an apparatus was constructed as illustrated in Fig. 1. The manometer was fitted with a scale in arbitrary units and, by means of an inconspicuous tap, could be connected to a syringe, thus creating a back pressure and decreasing the reading on the scale. By means of this apparatus, with appropriate arrangements of the clips and taps, varying volumes of sterile saline solution could be introduced into the patient's bladder, true or decreased pressure readings could be taken at any stage, and the patient's bladder could be voluntarily evacuated, the outflow being measured in a cylinder. In use the manometer was placed at bladder height and immediately before the *S* where she could read the scale.

The patient was given elementary instruction in the physiology of urination, the nature of the apparatus (except for the function of the syringe) was explained, and she was told that, after the apparatus had demonstrated the nature of her malfunctioning, she would be

[2] Bykov describes this experiment in terms of "conditioning." Others may prefer to class it with experiments on "suggestion" in that the phenomenon observed has much in common with such well-known effects as the "heat illusion," generally described in terms of suggestion.

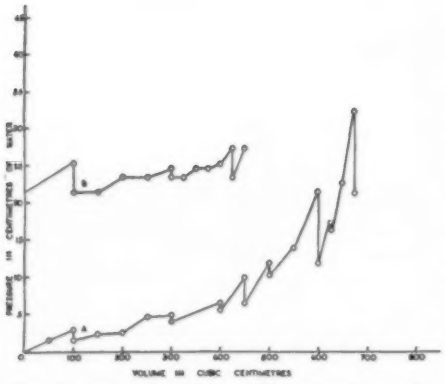

FIG. 2. CYSTOMETROGRAMS. A. NORMATIVE DATA. B. PATIENT'S RESPONSES DURING THE FIRST TRIAL

trained to achieve normal reactions. The apparatus was then set up and saline was introduced into the bladder, true pressure readings being taken at intervals. The results are shown in Fig. 2. For comparison the graph includes data reported by Denny-Brown (2), illustrating the reaction of a "normal" bladder. Each curve ends where the urge to urinate became imperative.

From these data, the patient's bladder responses may be described as abnormal in three respects: (*a*) The urge to urinate occurred at relatively low bladder volumes and pressures. The threshold pressure, equivalent to about 27 cms. of water, corresponded to the figure 7 on the arbitrary scale. (*b*) The patient's detrusor muscle responses to changes in bladder volume were abnormally sluggish. Normally the bladder wall reacts to increased fluid with increased tension followed by an adaptive relaxation producing a zigzag effect on a graph. (*c*) The bladder musculature maintained abnormally high bladder pressure at low bladder volumes. In the graph shown, the pressure was in fact only just subliminal throughout, and the patient reported urgency at a volume of 300 cc.

Of these abnormalities the first was expected to respond to the conditioning technique, and it was hoped that the others would improve with practice and attempts at voluntary relaxation.

Three further trials were carried out on the first day of treatment. During the first two, the manometer was left open to the atmosphere and, when the bladder contained some 300 cc. of fluid, attempts were made by the patient to lower the manometric reading by voluntary relaxation. Tension of various body muscles, as would be expected, increased the pressure, but relaxation had no effect. These two trials showed a little improvement over the first in that 550 cc. of fluid were retained, and the pressure during the earlier part of the curve was slightly lower at about 20 cms. of water. The threshold for urgency remained at the arbitrary figure of 7. For the last trial, the manometer was connected to the syringe, thus artificially lowering the manometric readings. This technique had the expected effect in that the patient now retained over 600 cc. of fluid, but the "true" threshold pressure was little if any higher than previously. On this and later occasions when the back pressure was utilised, the patient was encouraged, when she reported urgency, to accept a little more fluid. While it was being introduced, the syringe was disconnected, allowing a final "true" pressure reading. This modified procedure was adopted in order to demonstrate to the patient that she was able to tolerate increased pressures as well as increased volumes and because she was aware of the nature of her abnormalities.

The apparatus was again used two days later. The first trial, with the manometer open, was generally similar to the middle trials of the first session as was the second, during which the patient was standing instead of

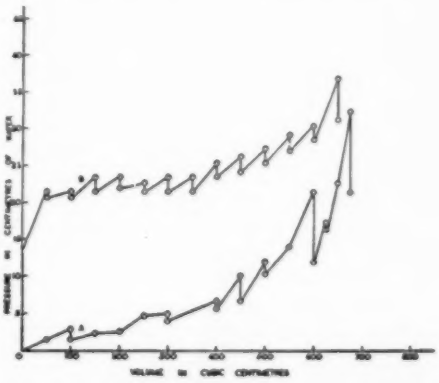

FIG. 3. CYSTOMETROGRAMS. A. NORMATIVE DATA. B. PATIENT'S RESPONSES DURING THE THIRD TRIAL OF THE SECOND SESSION

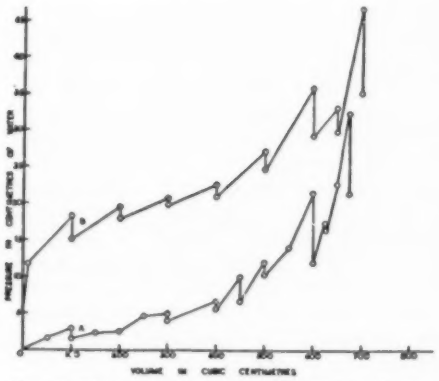

FIG. 4. CYSTOMETROGRAMS. A. NORMATIVE DATA. B. PATIENT'S RESPONSES DURING THE FIRST TRIAL OF THE FOURTH SESSION

sitting as previously. For the third and last trial of this day, the manometer was connected to the syringe. The results are shown in Fig. 3 where it may be seen that the first abnormality, relating to the pressure and volume at the outset of urgency, was more or less eliminated and, most strikingly, the adaptive contractions and relaxations of the bladder wall were clearly evident. This change apparently resulted from the repeated stimulation. The third abnormality, relating to high pressures at low volumes, was essentially unmodified.

Similar use of the apparatus was made on two further occasions at intervals of three and two days. Figure 4 refers to a trial on the fourth occasion and illustrates considerable modification of the original bladder reactions. The pressure at low volume was less but still abnormally high. There was, however, a considerable range of pressure below the threshold value. The fifth and final session, two days later, was devoted to an unsuccessful attempt at modifying the lower end of the curve. Immediately after bladder evacuating, the pressure fell to a value lower than 2 cms. of water, but invariably, after a period between about 2 secs. and 30 secs., the pressure suddenly rose to about 14 cms. of water. This rise seemed to be precipitated by any activity such as a laugh or cough, or by the addition of a small volume of fluid to the bladder; but even in the absence of such specific stimuli, the rise invariably occurred.

After the first day's treatment the patient reported that she felt "easier and more confident" and appeared to derive satisfaction from the knowledge that she could retain a fairly large volume of fluid in her bladder. After the third session she became markedly cheerful and optimistic. At this stage she successfully completed a game of tennis, whereas she had previously been unwilling to embark on any strenuous activity, fearing that it would precipitate urination. This confidence, optimism, and enterprise increased during the remaining sessions. She now intended to seek employment, possibly as a telephone operator, and to make a gradual return to the stage via evening engagements. A week after the cessation of the laboratory treatment, her urinary frequency had practically disappeared and no other symptoms were evident in the setting of the day-hospital. The prospect of venturing into the streets, however, induced a strong anxiety reaction. Thus, she reported spending "about an hour thinking about it" before leaving for home in the evening. She would not accompany *E* outside the gates of the hospital, claiming that she would require time for mental preparation. It was therefore decided to devise a training program aimed at the elimination of this anxiety reaction.

TREATMENT OF THE ANXIETY REACTION

The therapeutic problem may be described in terms of substituting for the original dominant (anxiety) reaction an alternative (normal) reaction to the stimulus of being placed in a public situation. Guthrie (4) suggests that one way of achieving such a substitution is to present the stimulus at reduced intensity so that the accustomed response is not elicited. Presumably, the presentation of a stimulus qualitatively remote from the original, but occupying a position on the generalization curve of the latter, would operate in the same way as a reduction in stimulus intensity. On the basis of such a theoretical formulation, a graded re-education program was devised, concentrating, in order to maximize the motivation related to the alternative reaction, on the stage situation. Wolpe (8) has reported animal experimentation which would serve as a paradigm for such a technique and quotes (9) the successful treat-

ment of many psychiatric conditions by somewhat similar methods.

The treatment involved a daily program in several stages. In a secluded garden, the patient first embarked alone on a training course of limbering-up exercises to make her physically fit for dancing. She then devised and rehearsed a dance routine, first concentrating on the movements and then on acting as if before an audience. She was encouraged to imagine such an audience and to "live the part" as actively as possible. She then gave a "private showing" to the *E*, and, finally, she performed successfully in a public nonprofessional stage show. In this way the normal response was gradually shifted along the stimulus generalization continuum until it superseded the original anxiety reaction. Parallel with this training, the patient made unrehearsed and progressively more extensive outdoor expeditions.

A fortnight after the commencement of this treatment the patient was discharged from the day-hospital. The public stage appearance took place a short time after discharge. Though it was intended that she should attend the hospital at intervals as an outpatient, she only attended one follow-up clinic one month after discharge. She then reported that her urinary frequency and general condition were greatly improved. She still experienced some anxiety about traveling in the rush hour and suffered occasional brief depressed moods but felt better able to combat them. She had obtained a job in a shoe shop but hoped to change to a better one in a theatrical agency and ultimately to return to the stage. Fifteen months after her discharge, her private physician reported that she had remained free of symptoms and had recently married with apparent success.

DISCUSSION

During the course of the treatments described, the patient's long-standing symptoms improved considerably. That this amelioration resulted from the treatment cannot be asserted with confidence. Large-scale controlled studies involving such treatments would be necessary to establish their efficacy. It is hoped, however, that this paper demonstrates that it is possible to devise rational symptomatic treatment for psychiatric symptoms, whether physical or emotional in nature. That such treatment is symptomatic is, in the writer's view, no handicap. Much evidence points to the fact that neuroticism is largely a constitutional defect for which no effective radical therapy is yet available. The individual of neurotic constitution in certain environmental circumstances develops certain symptoms. The rational therapeutic approach is then to treat the symptoms and to modify the environment so as to avoid their recrudescence or the development of fresh symptoms. The more specific the treatment, the more likely may be its success.

SUMMARY

The treatment is described of a psychiatric patient who, in the framework of an emotional disorder, presented a disabling somatic symptom in the form of abnormal frequency of micturition, especially evident when she was in public places or engaged in her profession of dancing. Intensive investigation failed to reveal any organic basis for this symptom, and psychotherapy during a period of hospitalization failed to produce any amelioration. Since bladder responses are susceptible to conditioning procedures, a plan of treatment including a conditioning situation and a graded training program was designed and executed.

It was shown that the patient's bladder responses were abnormal in three aspects: (*a*) Urgency occurred at abnormally low bladder pressures and volumes. (*b*) The muscular responses to changes in bladder volume were abnormally sluggish. (*c*) The bladder musculature maintained abnormally high bladder pressures at low bladder volume.

The first abnormality responded rapidly to the conditioning technique employed. The second disappeared, apparently as a result of exercise. The third was partially modified. After the laboratory treatment, considerable improvement in the patient's general condition was evident in a nonstressful environment, but a graded re-education program was necessary before effective relief from the symptoms in normal life situations was achieved.

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CRITIQUE AND NOTES

THE COMPARABILITY OF POSITIVE AND NEGATIVE ITEMS IN SCALES OF ETHNIC PREJUDICE[1]

NORMAN M. PRENTICE

Harvard University

IN THEIR explorations of ethnic prejudice and its underlying personality correlates, Adorno *et al.* (1) devised several attitude scales in which the items were predominantly or entirely negative. For example, the California Ethnocentrism (E) Scale was constructed so that agreement with items depreciating ethnic groups (negative items) measured intolerance, while disagreement with these same items was thought to measure tolerance. Levinson (1, 3) was persuaded that the use of all negative items in this scale enhanced its discriminability. He felt that prejudiced respondents could more openly agree with items that depreciated ethnic groups than they could disagree with items favorable toward ethnic groups (positive items). However, as Rokeach and Eglash (4) have recently implied in another connection, agreement on all-negative item scales of ethnic prejudice provides a rigorous criterion only for the absence of tolerance, while disagreement provides no more than presumptive evidence for the presence of tolerance. The logical possibility remains that disagreement with negative items may occur on other grounds (e.g., negativism) and may not be equivalent to the expression of tolerance registered on positive items. This report presents findings that shed some light on the comparability of reactions to positive and negative items on such scales.

METHOD

Test measures. Two scales measuring attitudes toward ethnic groups were utilized in this study. The first of these was an 18-item form derived from the California E Scale; it was composed equally of items relating to Jews and Negroes.[2] All of these items were "negative," i.e., critical of these ethnic groups. The second instrument, a 32-item scale labeled the Intolerant-Tolerant (IT) Scale was constructed specifically for this study for reasons which will be presented in a future report. This scale consisted of 16 "positive" items stating a tolerant or supportive position regarding Jews and Negroes, and 16 "negative" items.[3] Most of the IT Scale items were similar in content to those of the E Scale although none was identical in form. Moreover, some of the IT Scale items referred to aspects of Jewish and Negro stereotypes not explicitly included in the E Scale. No attempt was made to match specific content of the positive and negative items in the IT Scale although some overlapping of content occurred.

Subjects. These two scales together with a battery of other tests were taken anonymously by 66 freshman students attending Boston University in May, 1955.[4] All *Ss* were native white Christian males.

Analysis. A single score was derived from the E Scale in the usual manner. The IT Scale yielded three distinct scores. The sum for all negative items represented the IT Negative Subscale score, while that for all positive items was the IT Positive Subscale score. Responses on the latter items were scored in reverse. Thus a +3 rating ("I agree very much") received a code score of 1 point on this scale rather than of 7 points as on the E and IT Negative Subscales. For all scales, therefore, higher scores represent greater intolerance. A third measure, the IT Total Scale score, was simply the sum of the two IT Subscale scores.

RESULTS

Table 1 presents the intercorrelations and reliability coefficients, and Table 2 the means and standard deviations for these scales. As Table 1 indicates, scores on the IT Total Scale, composed of a mixture of positive and negative items, as well as scores earned on the IT Negative Subscale alone, correlate substantially (.83 and .86, respectively) with E Scale scores. The IT Positive Subscale correlates less highly (.64) with the E Scale, although the relationship is still considerable. Over all, the correlations are impressive in view of the lack of refinement of the IT Scale items compared with those of the E Scale, and the fact that the items in the various scales were not identical.

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[1] The author wishes to thank Drs. Daniel J. Levinson and Nathan Kogan for generous assistance in the preparation of this report.

[2] Items chosen from Adorno *et al.* (1) were numbers: 8, 22 (pp. 68–69); 13 (p. 70); 2, 31 (pp. 110–111); 37 (p. 117); and 1–6 of Subscales A and B (p. 142).

[3] Sample positive items were: "Many Jews should not be denied admission to the best schools, neighborhoods, or social clubs"; "No Jews are especially loud, noisy and overbearing"; "Many Negroes are to be encouraged in dating white girls who like them." Sample negative items were: "Jews are shady, clannish businessmen who are likely to use cut-throat practices"; "The Jew is eager to escape plain hard work because he really likes a soft life"; "No Negroes should really be allowed to intermingle freely with whites at dances and schools."

[4] The cooperation of Dr. G. Norman Eddy and Mr. Robert Smart, Social Science Department, Boston University College of General Education, in making *Ss* available for this study is gratefully acknowledged.

TABLE 1
INTERCORRELATIONS AND RELIABILITY COEFFICIENTS FOR ATTITUDE SCALES

	E	IT:Pos	IT:Neg	IT: Tot
E	(.87)*			
IT:Pos	.64	(.78)		
	[.78]‡			
IT:Neg	.86	.68	(.85)	
	[1.00]	[.84]		
IT:Tot	.83	.90	.93	(.90)
	[.93]	[1.07]†	[1.06]†	

* Odd-even reliability coefficients are given on the diagonal.
† These values are not regarded as significantly different from unity. For discussion see Garrett (2, p. 337).
‡ Bracketed values indicate correlation when corrected for attenuation.

TABLE 2
DESCRIPTIVE STATISTICS FOR ATTITUDE SCALES
(N = 66)

	E	IT:Pos	IT:Neg	IT:Tot
No. of items	18	16	16	32
Scale mean	51.17	54.98	46.36	101.15
SD	19.91	12.06	13.93	23.80
Item mean	2.84	3.44	2.90	3.16

The item means provide additional information to refute the assumption that respondents can more openly agree with negative items than they can disagree with positive items. As Table 2 indicates, *S*s were slightly more able to express their intolerant sentiments on positive items than they were on negative items (a mean of 3.44 on IT Positive Subscale items as against 2.84 and 2.90 for E and IT Negative Subscale items, respectively). As such, this finding also argues against the assumed superior discriminability of negative items.

CONCLUSIONS

These findings suggest that the use of positive or negative items or a mixture of both is immaterial in the measurement of ethnic prejudice. All-negative item scales do not appear to possess any intrinsic superiority as has been previously assumed. While these results support the choice of the E Scale when desirable for continuity with earlier research, they equally support the use of a mixed scale when an all-negative (or all-positive) scale is regarded as creating problems of rapport.

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EXTERNAL VALIDATION OF A MEASURE OF CONFORMITY BEHAVIOR[1]

MORTON WIENER, JANETH T. CARPENTER[2], AND BRUCE CARPENTER[2]
Central State Hospital, Indianapolis

THE measure described herein was devised to answer a need for an easily administered group measure of conformity behavior. We define conformity operationally as changes in judgment which occur as a function of information given about other people's judgments. This study is directed toward validating our conformity measure against an external criterion.

METHOD

The *S*s were 156 college undergraduates in a psychology course. Ten ambiguous designs were presented in the form of a mimeographed booklet to the *S*s in a single group administration. Six of the designs were adapted from those used by Carmichael, Hogan, and Walter (1), and the other four were of a similar kind. Each design in the booklet was on a separate page, and beneath each design were two alternative "names" for the design. The *S*s were instructed to designate which one of the alternatives they thought each design looked like. This task was completed in approximately two minutes.

Subsequently the *E*s entered arbitrarily chosen percentages in the booklets. Five of the designs were selected as "critical"; for these five designs the arbitrary percentages indicated disagreement with each *S*'s choice (regardless of which alternative he chose). For the other five designs, the arbitrary percentages indicated agreement with each *S*'s choice.

Three days following the first administration, the original booklet was returned to each *S* along with a duplicate booklet. The *S*s were told that the percentages

[1] The authors wish to express appreciation to Dr. C. C. Josey of Butler University for making his students available to serve as *S*s, and to Dr. Billie Mandl and Miss Edna Hancock for contributing ideas for the designs.

[2] Now at Florida State University.

TABLE 1

ANALYSIS OF VARIANCE OF CONFORMITY SCORES BY GROUP AND BY SEX

Source of variation	*df*	Mean square	*F*
Between groups	2	7.18	3.44*
Between sex	1	.95	—
Groups × sex	2	2.19	1.05
Within cell	150	2.09	

Note.—The Bartlett test for homogeneity of variance yielded a nonsignificant chi square.

* Significant at the 5 per cent level.

entered in the booklets represented the proportion of the class members who had chosen each alternative. The *S*s were instructed to ignore the choices they had made originally and to make objective choices in marking the second booklet. Following this administration, the number of changes in judgment made by each *S* was tabulated. The number of changes each *S* made on the five critical designs was designated his conformity score.

An external behavioral criterion was available against which to validate the conformity scores. As part of a larger investigation, the *S*s had been requested to complete other material on their own time and return it at the next class meeting. The *S*s were requested to cooperate, but no explicit coercion was exerted. However, since the experiment was conducted in part during a class hour, it was possible for *S*s to interpret the situation as requiring them to return the additional material.

RESULTS AND CONCLUSION

On the basis of their compliance in returning the additional material, the *S*s were divided into three groups. Group I ($N = 123$) completed the material and returned it on the date indicated; Group II ($N = 13$) completed the material but returned it later than the date indicated; Group III ($N = 20$) did not return the material at all. The mean conformity score for Group I was 2.07 with an *SD* of 1.54. Group II had a mean conformity score of 1.54 with an *SD* of 1.08. Group III had a mean conformity score of 1.20 with an *SD* of 1.25. An analysis of variance by group and by sex was computed (see Table 1). The differences between the three group means were significant at the .05 level of confidence. The interaction between sex and the return of the additional material was not significant.

The results indicate that there is a significant relationship between conformity as measured by changes in judgment on an ambiguous design task and behavior in a nonlaboratory situation.

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